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OBSTRUCTION OF THE COLON*

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Acute obstruction of the colon continues to be associated with a high mortality. The conviction that a better comprehension of the etiology, the diagnostic criteria, the pathology, and the proper methods of treatment when instituted early would lessen this mortality is the primary reason for choosing this subject for presentation. The mortality of acute occlusions of the large bowel ranges from 15 to 40 per cent or more. Michel and McCafferty,[11] in a review of 103 cases, reported a mortality of 29.1 per cent. Cutler,[3] in a survey of 123 case records of patients over 60 years of age, records a mortality of 56.9 per cent. Dennis,[4] in a study of 54 cases, reports a mortality of 15.1 per cent, and Hunt,[10] in 20 cases of obstruction due to cancer, states that there was a mortality of 26.6 per cent. In a series of 34 acute obstructions of the colon due to carcinoma seen at Scott and White Hospital and previously reported by the author, the surgical mortality was 7 deaths or 20.6 per cent. Certainly something should be done to improve the results of treatment of this disease.

The incidence of obstruction of the colon is difficult to determine. Statistical data indicate that the ratio of small to large bowel obstructions is about four to one. Due to this fact, when occlusion of the intestine occurs, first thought is given to small bowel obstruction. Burgess[2] reports that 18 per cent of 1,278 cases of obstruction were in the colon. Graham,[7] in a study of 104 cases of acute intestinal occlusion, found 77 per cent involving the small bowel and 23 per cent involving the colon. Pool and Dunavant,[12] in a study of 522 case records of intestinal obstruction, write that 48 or 9.2 per cent were in the colon.

The obstruction may be acute or chronic, complete or incomplete. The nature and degree of the obstruction is important, for it will modify the symptoms presented and will have a direct bearing upon the treatment of the patient. Acute obstruction is interpreted by Gruenfeld[9] as complete stoppage of the intestinal flow, and we consider his opinion logical. Furthermore, on the basis of clinical history, he divides the obstructions into unheralded acute obstructions, acute obstructions superimposed on chronic obstructions, and transitory acute obstructions. Recognition of these types of acute occlusion will aid in the study of this problem. The classification of many cases relative to the degree of obstruction is naturally somewhat arbitrary. This is illustrated by statistics from the following authors referable to what percentage of cases of carcinoma of the colon produce acute obstruction. The number reported by Rankin as having acute obstruction was 5 per cent; Dennis 9.54 per cent; Campbell over 30 per cent; and Hunt 20 per cent; whereas, in a series of 190 cases of cancer of the colon which we surveyed, 20.6 per cent were regarded as having acute obstruction.

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From this statistical data and my clinical observation, it seems logical to conclude that 10 per cent or more of carcinomas of the colon produce obstruction.

ETIOLOGY

It is important to give proper consideration to the varied etiology of colonic obstruction since the cause of the occlusion frequently modifies treatment. Obstructions here are produced by anomalous developments, nonspecific tumefactions, such as diverticulitis, tuberculosis, amebiasis, lymphopathia venereum, sometimes by volvulus, intussusception and extrinsic tumors, metastatic carcinoma, (See Fig. 1) post-

Figure 1.—This portrays an obstruction of the sigmoid due to metastasis from a carcinoma of the pancreas. It should be recognized that extrinsic tumors and metastatic carcinomas do produce obstructions of the large bowel.

irradiation changes, occasionally by benign tumors, and the most frequent of all causes, a malignant lesion. A fact worthy of emphasis is that 80 per cent or more of all acute obstructions of the colon are due to cancer. Dennis[4] found this incidence to be 65 per cent. Bruusgaard[11] reported 71.8 per cent; whereas Wangensteen[14] writes that 90 per cent of obstructions of the large bowel are due to cancer. Volvulus is the etiological factor in about 8 per cent of occlusions of the colon. Dixon and Miller[5] report that 11.6 per cent were caused by this condition. Griffin, Barton, and Meyer[8] found that 8 per cent of colon obstructions were due to volvulus of the sigmoid. Gerwig[6] states that in a survey of 100 obstructions of both small and large bowel, there will be 7 obstructions due to volvulus, and 3 of these will be in the colon. Diverticulitis is probably the third most frequent cause of obstruction of the large intestine (See Fig. 2). From the above data, it is

Figure 2.—Patient admitted with large mass in the left pelvis with obstruction of the sigmoid due to diverticulitis, decompressed by colostomy, adequate lumen re-established. Resection of lesion was not performed. A majority of these should have resection some two months later.

seen that cancer, volvulus, and diverticulitis produce more than 90 per cent of all the obstructions of the colon. This fact should be borne in mind when dealing with this problem. However, the less frequent causes of obstruction cannot be overlooked.

SYMPTOMS

Only a brief discussion of the clinical aspects will be made; however, some factors pertaining to clinical features deserve emphasis. Intestinal colic is invariably present. The pain is usually below the umbilicus. Peristalsis is not quite so frequent nor

pain so intense as that which occurs in obstruction of the small bowel. A majority of obstructions of the colon are in its distal portion and produce a rather general distention. This distention tends to be more around the periphery of the abdomen, and a notable late feature is a marked distention of the cecum. However, early in the left colic occlusion, distention is not so pronounced and occurs primarily just proximal to the lesion. During this stage of an occlusion of the left colon, the peristaltic rushes may occur at intervals of ten to twenty minutes, but later, after the entire colon has become distended, the interval between intestinal contractions is shorter, it now having the time interval of contraction waves of the ileum. The distention is due in part to continued emptying of the ileum into the colon through a competent ileocecal valve; therefore, a majority of the obstructions of the large intestine are in the nature of a closed loop obstruction. However, there are a definite number of colon obstructions which are not of this nature, for Dennis[4] reported a competent ileocecal valve in only 61 per cent of his cases. The most pronounced distention is seen in cases of volvulus of the sigmoid. In such instances, the patient has a large, localized, tympanitic mass extending from the lower left to the right upper abdomen, accompanied by acute tenderness and abdominal rigidity. The higher the obstruction is located in the intestinal tract, the more copious will be the vomiting; therefore, vomiting is not a pronounced symptom in obstruction of the colon. However, the serious condition of the patient should not be minimized because of its absence.

A cessation of action of the bowel is to be expected in obstruction of the large intestine; however, one should not fail to recognize an obstruction because of some return of flatus and feces following an enema. Sometimes the peristalsis is so pronounced that it can be seen. The recognition of visible peristalsis is modified by the completeness and duration of the obstruction, the thinness of the abdominal wall, and the intensity of the peristalsis. In some cases slight tension in the proximal coil of the intestine can be detected by general palpation. Frequently, the movements of gas can be felt and a slight peristaltic wave can be elicited even when there is no visible peristalsis. Metallic tinklings and the rumbling of gas synchronous with the attacks of pain can be heard by auscultation. This is further proof of the existence of intestinal colic.

An important fact is that simple intestinal obstruction does not cause abdominal tenderness and rigidity. Their presence denotes peritoneal irritation; and this usually demands immediate resort to surgical measures. The marked biochemical changes which occur rapidly in obstruction of the small bowel are not seen in obstructions of the colon. These alterations which accompany obstructions in the colon develop slowly and seldom are pronounced. Due to the manner in which high and low obstructions influence metabolic changes, the patient will tolerate an occlusion of the colon much longer than he will that of the small intestine.

While it is true that the clinical features of obstruction develop more slowly in occlusion in the large intestine than those which develop in the small bowel, notwithstanding this fact, if the obstruction has persisted long enough so that the blood supply of the intestine is impaired, the patient will frequently pass rapidly into a serious state and in a question of hours, the condition may become hopeless. Also, due to the nature of the blood supply and the thinness of the wall of the colon, perforations occur more often in the large than in the small bowel.

The diagnosis of the obstruction will be evident in come cases, while in others, it may prove to be a problem. The clinical history and physical findings are helpful. A scout film of the abdomen is a most important diagnostic aid. It will show distention of the colon from the cecum to the point of obstruction. The roentgenologist can determine usually whether or not an obstruction is present, and if so, whether in the small or large bowel. Gas shadows around the periphery of the abdomen are usually in

the colon. Centrally placed gas is more likely to be in the small intestine. When dealing with obstruction of the large bowel, the dilated loops tend to be in a vertical plane, the haustra produce a wave outline to the shadow, and there are no straight line edges. When present, the fluid levels are wide, due to the larger calibre of the bowel. In the small intestinal occlusions, the distended coils form a transverse pattern, the loops are smaller in calibre, and the mucosal folds cause a feather-like appearance on the film.

It is always injudicious to give barium by mouth to a patient in whom obstruction of the intestinal tract is considered likely. Sometimes in a suspected obstruction of the colon, a small barium enema is permissible. This usually will enable the roentgenologist to confirm the diagnosis, determine the location of the obstruction, and frequently ascertain the nature of the pathologic condition producing the occlusion. However, it needs to be remembered that a barium enema sometimes will convert an incomplete into a complete obstruction. The final diagnosis is dependent on a correlation of the history, the physical findings, and the report of the roentgenologist.

TREATMENT

The proper treatment for obstruction of the large intestine is determined by the nature of the pathologic condition producing the occlusion. Obstructions due to bands usually demand only the severance of the bands. When the occlusion is due to benign stricture, some type of entero-anastomosis around the obstructed segment will usually be found an adequate method of treatment, and extensive stricture of the rectum may require a sigmoidostomy. The treatment of volvulus of the cecum consists usually in an untwisting of the volvulus and a cecostomy. However, a volvulus of the cecum is rarely seen. Sometimes the volvulus of the sigmoid shortly following its development can be deflated by passage of a colon tube into the obstructing loop from below by the aid of a sigmoidoscope. However, for most cases, immediate surgery is indicated, at which time the extent of the operation should consist only of untwisting of the volvulus if the bowel is viable. An elective resection of such a sigmoid should be done some eight weeks later. When the loop of bowel involved in the volvulus is gangrenous, a primary resection is obligatory, and a Mikulicz exteriorization is the procedure of choice. (See Fig. 3). It is vital to recognize that cecostomy or a transverse colostomy cannot decompress a volvulus of the sigmoid.

Figure 3.—This diagram portrays a modified Mikulicz type resection for volvulus of the sigmoid.

A diverticulitis seldom produces a complete obstruction. The partial occlusion which it causes can usually be treated satisfactorily by medical management; however, there is an occasional case of diverticulitis in which the disease is so pronounced that it produces an acute obstruction. Practically all occlusions due to diverticulitis are located in the region of the sigmoid. Usually a mass can be palpated which is larger, more tender, smoother, less mobile, and not as firm as a malignant tumor. The roentgenologist can often determine the probable true character of the lesion. Furthermore, it is an important fact that coincidence of the two, carcinoma and diverticulitis, may occur. A transverse colostomy should be done to decompress an obstruction due to a diverticulitis. Most patients with a diverticulitis so pronounced as to produce an obstruction should be advised to have this segment removed later. This resection is usually performed some two months following the colostomy. Fibrous changes with resulting narrowing of the lumen of

the colon often result from the inflammation associated with a diverticulitis; therefore, as a means of maintaining ample calibre of the bowel following resection of the diseased segment, it is best to do a lateral anastomosis of the proximal sigmoid to the open end of the upper rectum. (See Fig. 4). Practically all cases with obstruction of the left colon due to an inflammatory condition or one associated with a perforation should be decompressed by a transverse colostomy. Surgical judgment should determine the proper plan of management for an obstruction of the large intestine due to the less frequent pathologic entities.

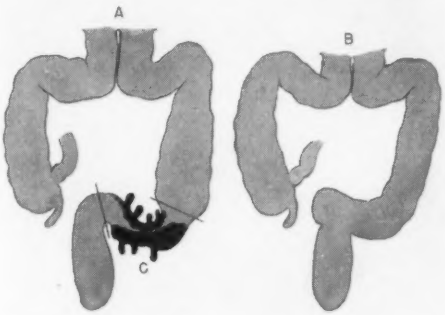

Figure 4.—This diagram demonstrates a lateral to end anastomosis of the proximal sigmoid to the open end of the upper rectum.

Eighty per cent or more of obstructions of the large intestine are due to malignancy, and 7 out of 8 of these are in the left colon; therefore, the predominating question concerns the preferable regimen for a patient with an occlusion of the colon caused by a malignant tumor. (See Fig. 5 and 6). To cure such a patient, it is necessary to resect the obstructing lesion widely. (See Fig. 7). Experience has proved that a primary resection of the colon never should be done in the presence of an acute obstruction caused by a neoplasm because it is unnecessary, and the mortality is prohibitive. Statistical data show that the mortality is more than doubled if operation is performed when the bowel is acutely obstructed. It is vitally important to evaluate the two conditions. The carcinoma is a slow growing, chronic lesion which has been present for months; whereas, the obstruction is an acute process of only hours' dura-

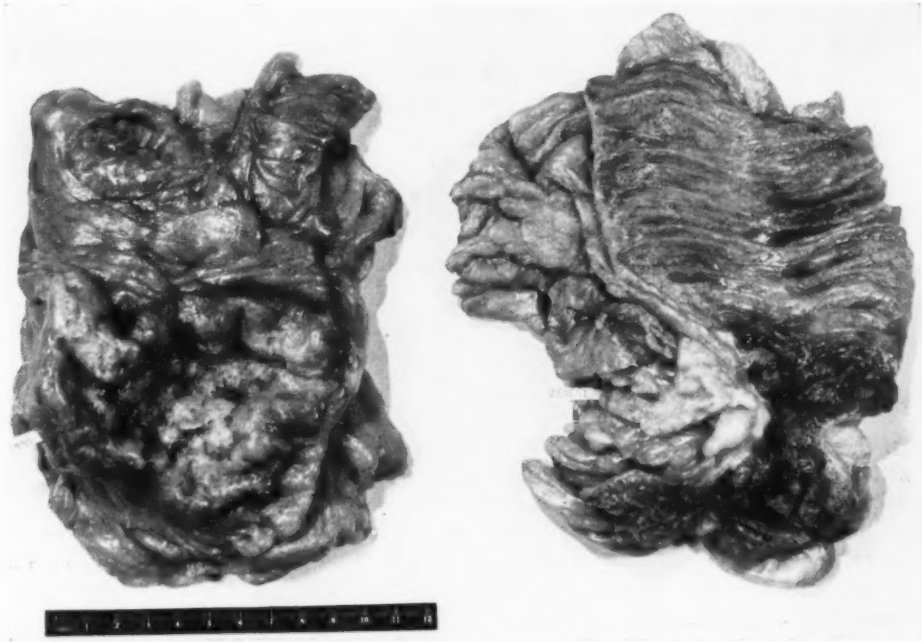

Figure 5.—Two carcinomas of the cecum. The one on the left is the predominating type of lesion of the right colon and is one reason accounting for the fact that only a few cancers of the right colon produce obstructions. The lesion on the right is an obstructing lesion of the cecum.

Figure 6.—Two separate carcinomas of the sigmoid. Observe the type of lesion which predominates in the left colon. This accounts for the fact that 7 out of 8 of all obstructions of the colon due to carcinoma occur in the left colon.

tion which could soon prove fatal. The only rational procedure, therefore, is to relieve the obstruction, ignoring for the time the existence of the malignancy. Evidently, the imperative need of such a patient with this condition is a decompressing procedure to relieve the distention.

When proper evaluation is made of what a surgical decompression does for such a patient, the rationale of the procedure becomes apparent, for it will relieve the distention and then normal blood supply to the bowel will be restored. The infection within the intestinal wall will subside. The number and virulence of the bacteria in the lumen will diminish greatly. The ulcers on the mucosal surface will heal and the edema of the intestinal wall will disappear, frequently restoring a patent lumen at the point of the constriction. When this occurs, it will permit cleansing of the colon by a through-and-through irrigation. The general effects obtained are that the biochemical changes will become normal and the nutritional status of the patient will again be restored.

DECOMPRESSION

An ileotransversostomy can be used for most cases to decompress an occluding lesion of the right colon because the ileum will be anastomosed to the transverse colon beyond the point of the obstruction where there will be a normal intestine. (See Fig. 8). Furthermore, if the obstructing lesion of the right colon has not produced material changes in the terminal ileum, a primary resection can be safely performed usually, since the anastomosis will be made in relatively healthy intestine. Occasionally when the right colon lesion completely occludes the lumen of the bowel and the ileocecal valve is competent, it is then necessary to do a cecostomy to decompress such a bowel. This occurs only rarely. Sometimes it may be found desirable even to do an ileostomy and then decompress the cecum by passing a catheter through the ileostomy into the cecum. An obstructing car-

Figure 7.—An obstructing carcinoma of the splenic flexure with metastasis to renal pedicle. Colon was decompressed by cecostomy, and later, a resection was done. This illustrates the fact that a fair number of carcinomas of the bowel involve contigious structures which necessitates their removal at the time of resection of a segment of the colon.

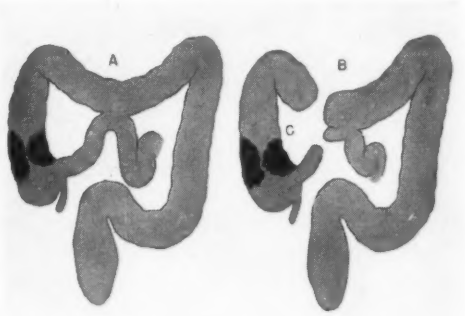

Figure 8.—This portrays an ileotransversostomy which is used as a decompressing procedure for most occluding lesions of the right colon. Usually a resection of the right colon is performed some three weeks following the ileotransversostomy.

cinoma of the left colon should be decompressed by one of two procedures, a cecostomy or a transverse colostomy. A cecostomy is advised when the patient is admitted with an acute obstruction of short duration. Such cases may be regarded as unheralded acute obstructions. The distention of the colon is often pronounced in such cases and is due largely to gas. The symptoms are of a fulminating nature and the patient may rather rapidly pass into a serious state. A cecostomy performed under local anesthesia will usually adequately decompress such a colon. (See Fig. 9). In a previous paper,

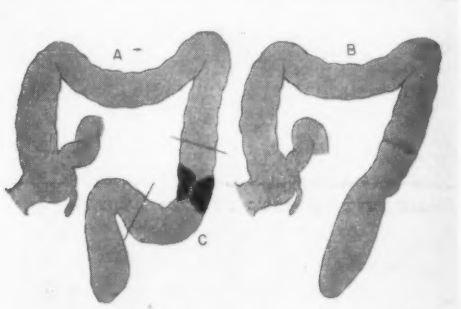

Figure 9.—This diagram portrays a cecostomy performed for obstructing lesion of the left colon.

we reported 46 cecostomies performed for obstructing carcinomas with a mortality of 8.7 per cent. During the past eight years,

90 decompressing procedures of the colon have been done with only 4 deaths, a mortality of 4.4 per cent. The technique used in performing a cecostomy is very important. It is done after the following procedure. A rather free right muscle splitting incision is made under local anesthesia. Usually a distended cecum will protrude in part through the incision. If it does not, then the cecum can be mobilized readily by severing the tissues lateral to it. An endeavor is made to deliver a portion of the cecum some 7 cm. or more in diameter and 3 or 4 cm. above the abdominal wall. It is vital that no sutures be placed in the cecum to anchor it in position. Sometimes a few stitches are taken in tabs of tissue or bands that are attached to it; however, the cecum is largely held in place by vaseline gauze applied snugly around it. The incision is closed with the cecum protruding well above. Now the wound is packed off and the cecum is deflated with a large needle before introducing a catheter into it. A pursestring suture inverts the cecum around the catheter and anchors it in the bowel. There is no contamination of the peritoneal cavity or the abdominal incision by this technique. Usually after some three or four days, the catheter is removed and the cecum is widely incised.

A transverse colostomy is advised when the patient is admitted with a chronic type of obstruction of the left colon which has gradually become more pronounced over a period of days. This type of colon is filled with semisolid content rather than gas. The patient with such an obstruction is usually not so gravely sick and his physical status is such as to permit the performance of a transverse colostomy which is necessary for the decompression of this type of colon. A loop colostomy is done, (See Fig. 10) for it is simple in execution and will prove adequate for the relief of the obstruction, and also, for the preparation of the bowel for resection later. The necessity for the complete diversion of the intestinal content in preparing the bowel for resection later has been overemphasized. It has been stressed repeatedly by many surgeons that a small

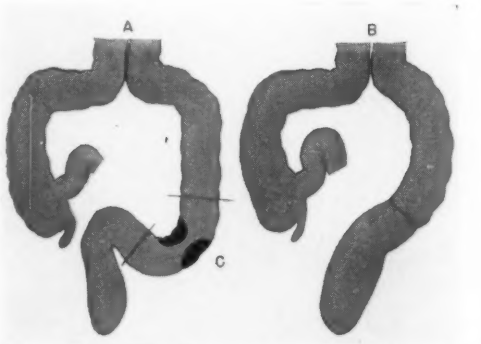

Figure 10.—This diagram portrays a transverse colostomy which is the procedure used most often for the decompression of the colon due to an obstructing lesion in the left segment. Usually a resection of the carcinoma of the left colon is performed some two or three weeks following the primary transverse colostomy.

amount of soiling such as occurs in performing an open anastomosis does not cause peritonitis, but that peritonitis is due to the continued or repeated contamination of the peritoneum. Likewise, if a small amount of bowel content does pass into the distal loop, it adds but little if any hazard to the subsequent resection. A sigmoidostomy should be done for an obstructing, inoperaable neoplasm in the rectosigmoid and rectum. (See Fig. 11).

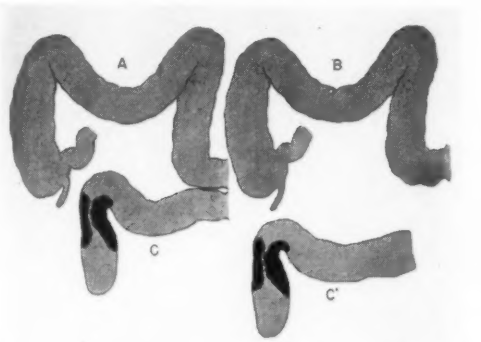

Figure 11.—This diagram portrays a sigmoidostomy which is indicated for obstructing, inoperable neoplasms of the rectosigmoid and rectum.

CONCLUSIONS

It seems logical in concluding this discussion to emphasize some things to do and others not to do in treating an obstruction of the colon. When due consideration is given to the several factors which contribute to the high mortality of obstruction

of the colon, this mortality will become less. The failure to recognize promptly an existing obstruction definitely increases the mortality. It is vital to recognize that a small bowel and a colon obstruction are two distinct diseases. The etiology, the resulting physiologic changes, and the proper treatment are quite different for the two types of obstruction. It needs to be appreciated that a majority of the obstructions of the colon are in the nature of a closed loop and that the primary factor threatening the viability of the intestine with this condition is the increased intraluminal tension. A closed loop obstruction is a potentially strangulated obstruction and should be considered an urgent surgical emergency. It is important to recognize that a long tube introduced into the small intestine cannot decompress an obstructed colon. The imperative need of such a patient is a surgical decompression which is the only therapy that will relieve this distention. A prolonged clinical study of these cases before instituting surgical decompression is not justified, for the delay incurred definitely adds to the mortality. Barium meals and the injudicious use of barium enemas aggravate the obstruction and tend to increase the mortality. Temporizing measures and continued attempts to relieve this condition by medical treatment frequently will force such a patient to accept a hazardous rather than a relatively safe surgical decompression. Unquestionably the delay occurred by an attempt to decompress the obstructing colon by a long tube and the late institution of surgical decompression are two primary factors definitely contributing to the high mortality of occlusion of the large bowel. The choice of the surgical procedure for the decompression and the technique of its execution are of much importance. As a rule, the simplest procedure which will relieve the intestinal distention and the one involving the least handling of the intestine is the procedure of choice. The supplementing of a decompression procedure by abdominal exploration should not be done, for it will definitely increase the over-all mortality of this disease. Experience has proved that a primary resection of the colon with anastomosis should never be done in the presence of acute obstruction, for it is unnecessary, and the mortality is prohibitive. Let it be recognized that when strangulation obstructions are excluded, the chief factor affecting the viability of the intestine in the majority of the obstructions of the large bowel is the increased intraluminal pressure from colonic distention. This can be relieved only by a surgical decompression, and when this is done promptly, with little manipulation and without exploration, it will usually prove life saving.

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INCIDENCE AND TYPES OF SALMONELLA INFECTIONS IN LOUISIANA*

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Our present day knowledge of the antigenic structure of the Salmonella organisms and the serologic variation to which they are subject now makes it possible to identify and classify over two hundred species, and each year new ones are being added. Many of the species are pathogenic for man and/or animals and quite a few are known to be transmissible from one to the other. However, unusual though it may seem, several of the species that have been isolated from normal healthy animal carriers have now been described as the causative agents of infections in man.

In 1942, an outbreak of food poisoning was reported by us[1, 2] in which *Salmonella berta* was described as a "new etiological agent". *S. berta* was recovered from the stools of six of the patients and from a sample of pork sausage which they had eaten. Up to that time, pathogenicity of this particular species for man had not been recorded. It had been isolated by Hormaeche, Salsamendi and Peluffo[3, 4] from mesenteric glands of normal pigs in Montevideo, Uruguay. Since this report it has been found to be the causative agent in several other outbreaks of food poisoning in other parts of the country.

The conquest of salmonellosis of human origin, especially that caused by the familiar typhoid and paratyphoid species, is probably one of the greatest public health achievements of modern times. Yet, by far the majority of the Salmonella group of bacteria are of animal origin. Many question the public health significance of these species and the necessity for identifying them with certainty. Such a fallacy originates from a failure to fully realize their clinical significance. It is an accepted fact that infections caused by those of animal origin are no longer limited to mild cases of gastroenteritis. Many cases of severe and fatal types of disease, especially in infants, young children, and the aged have been reported. It is further known that these organisms may invade any tissue or organ of the body and are not confined to the enteric tract as previously believed.

TYPING SERVICES

Accurate laboratory diagnosis is necessary for the identification of the various species of Salmonella. Serologic type-diagnosis by means of an analysis of the somatic (0 and Vi) and the flagellar (H) antigens of the Salmonella bacteria, and additional typing of *S. typhosa* by bacteriophage with specific Vi-phage preparations along with a few biochemical tests are the only reliable and consistent laboratory methods of species identification. Although these methods have been used on a limited basis in our laboratories for some time, it was not until 1950 that complete typing services were established in the Central Laboratory of the Louisiana State Department of Health. Since then, these services have been available to all laboratories in the state through our branch laboratories situated at strategic points throughout the state and the Central Laboratory in New Orleans. The Central Laboratory has also been designated as a regional laboratory for bacteriophage typing of *S. typhosa* serving Mississippi, Arkansas, and Louisiana.

These complete typing services have been made available mainly through the assistance of Dr. P. R. Edwards of the Communicable Disease Center in Atlanta, Georgia. Specific typing antisera, bacteriophage preparations and authentic cultures were furnished through the Communicable Disease Center, and several of our technologists have been especially trained in the correct performance of these tests by Dr. Edwards and his staff. Consultation service is available at the Communicable Disease Center at all times and all questionable cultures are checked and identified by them.

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*Presented at the Seventy-second Annual Meeting of the Louisiana State Medical Society, Shreveport, April 30, 1952.

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During the past two years, 260 cultures of Salmonella have been typed and classified in our laboratory according to the Kauffmann-White schema. This systematized plan of classification is now universally used, and was evolved from the efforts of many workers, but especially from the comprehensive and complex studies of White[5, 6] and Kauffmann.[7] Prior to adoption of this schema, much confusion in identification of Salmonella organisms existed. Each worker in the field had his own system of identification, classification, and nomenclature, and often the work of one could not be duplicated by others.

According to the schema which White and Kauffmann set up, an antigenic formula was arbitrarily given to each species of Salmonella. Roman numerals were assigned to the somatic antigens and the Salmonella strains were divided into large groups on the basis of a common somatic antigen. Small Roman letters and Arabic numerals were assigned to the flagellar antigens. The large groups were then subdivided into species according to the antigenic variations of their flagellar antigens. By means of agglutination tests with specific antisera each component can be identified separately and then classified according to the schema.

INCIDENCE AND TYPE IN LOUISIANA

Table 1 lists the various types, antigenic structure, and the frequency of the Salmonellae isolated in Louisiana during 1950-51. The table represents a complete analysis of all cultures isolated from specimens of active cases, carriers and food handlers by the Division of Laboratories. It also includes a number of cultures sent in from

TABLE 1

FREQUENCY OF SALMONELLA TYPES ISOLATED IN LOUISIANA 1950-51

Kauffmann-White Group	Types	O Antigen	H Antigen Phase I	H Antigen Phase II	No. of Cases	No. of Carriers	Other Sources	No. of Cultures
B	*S. bredeney*	I, IV, XXVII, XII	l, v	1, 7	1			1
	S. derby	I, IV, XII	f, g	.....	3			3
	S. paratyphi B	I, IV, V, XII	b	1, 2	1			1
	S. typhimurium	I, IV, V, XII	i	1, 2	14		1	15
C_1	*S. bareilly*	VI, VII	y	1, 5	5		2	19
	S. cholorae-suis	VI, VII	c	1, 5	2			2
	S. oslo	VI, VII	a	e, n, x	1			1
	S. paratyphi C	VI, VII, Vi	c	1, 5	2			2
	S. montevideo	VI, VII	g, m, s	.....	9		4	19
	S. tennessee	VI, VII	z_{29}	.....	5			5
	S. oranienburg	VI, VII	m, t	.....	6			6
C_2	*S. kentucky*	(VIII), XX	i	z_6	1			1
	S. manhattan	VI, VIII	d	1, 5	1			1
	S. muenchen	VI, VIII	d	1, 2	8			13
	S. newport	VI, VIII	e, h	1, 2	10			10
D	*S. berta*	IX, XII	f, g, t	.....	1			1
	S. enteritidis	I, IX, XII	g, m	.....	1			1
	S. javiana	I, IX, XII	l,z_{28}	1, 5	1			1
	S. panama	I, IX, XII	l, v	1, 5 or 1, 11	1			1
	S. typhosa	IX, XII, Vi	d	.....	81	25		149
E_1	*S. anatum*	III, X	e, h	1, 6	1			1
	S. give	III, X	l, v	1,7	2			2
E_2	*S. newington*	III, XV	e, h	1,6	1			1
G	*S. mississippi*	I, XIII, XXIII	b	1, 5	1			1
I	*S. gaminara*	XVI	d	1,7	1			1
Further Groups	*S. inverness*	XXXVIII	k	1, 6	1			1
	S. urbana	XXX	b	e, n, x	1			1
Total					162	25	7	260

New Orleans Charity Hospital and a few from other sources. Approximately 30 per cent of the cultures studied were isolated from hospitalized patients. This gives some idea of the severity of diseases that these bacteria are capable of producing.

Analysis of the table will show that a total of 27 serological types were identified. Of the cultures 97.9 per cent were members of the first five serological groups of the Kauffmann-White classification. Excluding *S. typhosa*, the largest number of cases was due to *S. typhimurium*, while infections due to Group C far outnumbered those of any other group. This type distribution closely approximates that found in other parts of the United States as reported by Edwards and Bruner[8] (1943) and Seligmann, Saphra, and Wassermann[9] (1946).

BACTERIOPHAGE TYPING

In addition, *S. typhosa* can be subdivided into subtypes by means of the bacteriophage method of typing. Bacteriophage typing of *S. typhosa* with specific Vi-phage preparations was introduced by Craigie and Yen[10] (1938), and its great value in the control of typhoid has been attested by many workers. It is of invaluable aid to the epidemiologist in the study of sporadic cases, outbreaks, and the relation of cases to carriers. A typhoid carrier can only be incriminated in cases of typhoid fever in which a Vi-phage type is recovered similar to the strain which is being excreted by him. In other words, a carrier excreting Type C organisms is not responsible for cases in which Type B organisms are isolated.

Successful typing can only be accomplished by using a standardized technique with specific phage preparations. In 1950, the United States Public Health Service set up a National Typing Center at the Enteric Bacteriology Laboratories, Commnunicable Disease Center, Atlanta. The United States and its possessions were arbitrarily divided into 14 areas. In each area one laboratory with personnel especially trained was designated as a regional center to serve one or more states. A set of standardized Vi-phage preparations was furnished through the Communicable Disease Center to each regional laboratory. As previously stated, the Central Laboratory of the Louisiana State Department of Health was designated to serve Louisiana, Mississippi, and Arkansas.

Table 2 lists the various Vi-phage types which were identified during 1950-51 in Louisiana and the frequency with which they occurred. From 81 cases, 12 different

TABLE 2
VI-PHAGE TYPES OF *SALMONELLA TYPHOSA* FROM CASES AND CARRIERS IN LOUISIANA—1950-51

Vi-phage type	Number of Cases	Number of Cultures	Number of Carriers	Number of Cultures	Total	
					Cases & Carriers	%
A	2	6	0	0	2	1.9
B_1	5	8	2	4	7	6.6
B_2	5	6	3	7	8	7.5
C	8	8	4	4	12	11.4
C_2 (Desranleau)	3	3	0	0	3	2.8
D_1	5	5	3	5	8	7.5
D_5	1	1	0	0	1	.95
E_1	27	30	4	14	31	29.2
F_1	3	3	1	1	4	3.9
F_2	5	6	0	0	5	4.7
N	0	0	1	1	1	.95
T	1	1	1	1	2	1.9
Wform	3	6	2	4	5	4.7
Degraded Vi	5	6	1	1	6	5.7
Untypable	8	13	3	5	11	10.3
Total	81	102	25	47	106	100%

phage types were isolated and from 25 carriers, 8 phage types were recognized. Of the cultures 25 (16.7 per cent) were untypable and 10 (6.7 per cent) were W forms. Buckle[11] in his analysis of typing of 2,297 cultures of typhoid cultures found 21.96 per cent untypable and 5.1 per cent W forms.

In studying Salmonella infections, it is obvious that the only satisfactory method is the identification and typing (serological and phage) of the organisms. The improved differential, selective and enrichment media now being used in the isolation of enteric bacteria from feces and urine make it possible for all laboratories to greatly increase their number of isolations. It is impossible to attempt to state the best procedure to use, as much depends upon facilities and available personnel in the individual laboratory. "An Outline of the Procedure for the Isolation and Identification of Salmonella and Shigella" which has been prepared for our branch laboratory personnel possibly could be adopted in full or part by other laboratories in the state. Copies of the outline and arrangements for training of technologists in this specialized field may be had upon request.

Complete typing service cannot be furnished by every laboratory, as it requires experienced and specially trained personnel and also a complete standardized set of antisera and Vi-phage preparations. These services are available in the Central Laboratory of the Louisiana State Department of Health, New Orleans, La. It is our desire to extend these services and eventually to have all laboratories throughout the state send in their cultures for confirmation and identification. Many laboratories, because of limited facilities, still depend on biochemical tests or agglutination tests with inferior antisera for identification of species. Reports on this basis are inaccurate and seriously handicap the health authorities in follow-up investigations.

At the present time, it is difficult to determine even the relative incidence of Salmonella infections in Louisiana. Aside from typhoid and paratyphoid fevers, these infections are not even reportable. According to the statistical report of the Louisiana State Department of Health, 143 cases of typhoid and 35 cases of paratyphoid fevers were reported during 1950-51. The authenticity of diagnosis, even in these reportable diseases, may be questioned. Diagnosis, too often, is based upon a wrong interpretation of agglutination tests of the patient's serum rather than by isolation and identification of an organism. Failure in the past to carry out a detailed study of the sporadic cases or even to distinguish the cases from carriers, seemed to be due to a lack of uniformity in the epidemiological services. However, with the advent of changes in procedure recently made by the Epidemiology Section of the Louisiana State Department of Health, it is felt that every reported case of communicable disease will be studied in detail. A questionnaire has been prepared to obtain pertinent information concerning the source of cultures which are sent to the laboratory for identification.

The clinician is not usually concerned with knowing exactly which of the more than 200 of this constantly increasing Salmonella group is causing the infection. He knows that the severity of the attack, the prognosis and the treatment do not depend on any one species. However, if control of Salmonellosis is to be accomplished, it is necessary that all epidemiological aspects of the disease be studied in detail and with accuracy.

SUMMARY

It is apparent that Salmonella infections in Louisiana are far more common than shown by statistical analysis of the reports of the Louisiana State Department of Health. It is difficult to eradicate a disease in which the organisms are so widely distributed in nature. To institute proper control measures a study of all epidemiological aspects of the disease will be necessary. This can be accomplished only in connection with the services of a well equipped and operated laboratory.

The laboratory must be in a position to furnish complete typing services through the assistance of a National Typing Center

and to have all other laboratories in the state cooperate with it. The Central Laboratory of the Louisiana State Department of Health has been in a position to furnish such service since 1950. The results of the service thus far show that 260 cultures from 162 cases and 25 carriers have been analyzed by serologic type diagnosis. A total of 27 serotypes have been identified. Further bacteriophage typing of 149 cultures of *S. typhosa* showed 12 different phage types. The 149 cultures were from 81 cases and 25 carriers.

With the adoption of new procedures to coordinate the epidemiological services of the Louisiana State Department of Health, organized services for studying Salmonella infections have been set up. To carry out the program, cooperation of the physician with public health authorities, and cooperation of hospital and other laboratories with the public health laboratory are necessary.

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THE MANAGEMENT OF ACUTE ANKLE FRACTURES*

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The progress in the treatment of injuries can be measured by the decrease in the morbidity associated with these injuries. We have seen this rather well demonstrated in the advance in the treatment of fractures of the femur by the use of intramedullary pins, the use of Smith-Peterson nails and their modification, about the hip, and the use of other measures designed to permit the patient to get along more comfortably and keep his hospitalization down to a minimum.

Relatively little progress has been made along these lines in the treatment of ankle injuries. It is true that those requiring open reduction can be undertaken with less hazard, because of the use of antibiotics; but there still remains, quite frequently, a morbidity out of proportion to the injury received. In addition, often the results obtained from the treatment of ankle fractures leave considerable to be desired in the matter of function and motion.

NECESSITY OF PROMPT DIAGNOSIS

This is due chiefly to the anatomy involved in this particular area. As you are quite aware, all the main structures in the form of blood vessels, tendons, and nerves, are all funneled around the ankle below the medial malleolus to supply the foot. These are covered with rather strong ligaments, the deltoid on the inner, and the fibula ligaments on the outer aspect of the ankle. When injury occurs, there is relatively little room left for swelling, so that as a result blister formation and skin deterioration are quite frequent. These lead quite often to a considerable delay before immmobilization can be applied; and in those cases requiring surgery, there is frequently prolonged delay necessary in order to allow the skin damage to right itself before any attempt of restoration of bony structure is carried out.

Since little can be done, insofar as the change in the construction of the ankle anatomically is concerned, it is necessary to use every means to forestall those elements which add to a prolonged morbidity and a poor result. These can best be alleviated by treating ankle injuries as an emergency. These cases should, therefore, be accurately diagnosed as soon as possible after injury, and the proper treatment instituted at that time. We have found that a delay of twelve to twenty-four hours from the time of injury until the time of definitive treatment will lead, in many cases, to an additional

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three to four weeks' hospitalization, and that the results obtained on this type of injury are not entirely satisfactory. One of the chief reasons for this is the fact that the bone around the ankle joint is a spongy type of bone which does not lend itself readily to accurate replacement after it has lost its initial strength. This same bone, when initially injured, can quite frequently be replaced accurately and held, either by plaster fixation or by open reduction as might be necessary; whereas, this cannot be done nearly so well in surgery or closed reduction carried out some two or three weeks later. This is particularly true in those injuries in which the articular surface is involved. There is frequently associated with this a rather severe damage to the articular cartilage, which is not visible by x-ray and which is not reflected entirely in any of the usual methods of examination. Further, as has been mentioned by several writers in this regard, diagnosis of a tear of the lower tibial fibula ligament, which results in a diastasis of the ankle, can be made rather easily when suspected early; whereas, after the ankle is swollen, this is much more difficult to determine. This, if undiagnosed, can frequently give a rather prolonged morbidity and a poor result.

TREATMENT

Because of the above mentioned factors, that is, the closed space type of the injury, the softness of the bone, and the frequent association of ligamentous injury, it is felt that these fractures should be accurately evaluated early, within several hours after the injury, by the usual methods of examination and by special x-rays, when such are indicated. Immediate closed reduction, in those cases where applicable, should be carried out with proper immobilization. The accurate reduction of the fracture tends to minimize the amount of bleeding which will occur and prevents the formation of clots between the bone fragments, which cause inaccurate approximation if reduction is carried out at a later date. Closed reduction should be checked by x-ray in those cases involving the joint itself with the ankle taken out of plaster, in order to assure one's self that the reduction is anatomically satisfactory. This is particularly necessary, because a slight irregularity in reduction will result in a traumatic arthritis involving the joint which cannot be well rectified by subsequent surgery.

In those cases in which there is any doubt about the accuracy of the reduction, where the weight-bearing surface of the bone is involved, surgery is resorted to as an emergency when the patient is seen. We have found that doing an open reduction on these cases within six to eight hours after injury has given uniformly satisfactory results. At least a part of these good results are due to the removal of blood and the opening of the closed spaces incident to reduction. All of these bleed rather freely following application of the cast and removal of the tourniquet. By closing tissues loosely but accurately the blood is able to escape to the outside without stretching the tissues and interfering with venous return. Routinely, in both open and closed reductions, a long leg cast is applied with the knee flexed about 45 degrees which further relieves the circulation so that in almost half the cases bivalving the cast is not necessary.

In addition, early open reduction has resulted in many unusual findings. In several instances, large portions of the articular cartilage have been found to be completely detached from their beds within the joint, or held by a very small attachment. These are usually associated with a small fragment of bone which can be visualized in a direct x-ray, but which are entirely invisible on an x-ray taken through a plaster cast. These cartilagenous portions can frequently be re-apposed at the time of surgery or, if they are not of particular size, can be removed with the expectation of a normal ankle resulting. Detached bone fragments also are encountered considerably displaced from their normal position, interfering with joint motion. Delayed restoration is usually unsatisfactory because of the increased damage to the remaining cartilage and degeneration of the loose fragments.

It is not the purpose of this paper to give

all the criteria for open reduction of the ankle. Three, however, must be emphasized. First, we consider those fractures involving more than one-third of the weight bearing surface. These are usually fractures of the posterior lip of the tibia, and frequently are associated with a fracture of the medial and lateral malleolus. It is necessary that the tri-malleolar fractures be held by internal fixation to give a satisfactory result, and to prevent further subluxation of the ankle. Occasionally, the anterior lip is involved, which usually is not materially displaced at the time first seen. However, apparently the pull of the anterior tibial muscle is sufficient to increase this displacement as time goes on.

Occasionally, some of the simpler injuries give difficulty and require fixation, although they do not appear to be particularly severe. In the very severely comminuted fractures of the ankle, it is difficult in any instance to obtain a satisfactory result. These frequently require fusion, but sometimes one can be salvaged if early treatment is instituted. Plating of the fibula, to serve as a splint and maintain length, is a considerable aid in this type of injury since firm restoration of the tibia itself is impossible.

In those cases with associated severe multiple injuries of the head, chest, or abdomen, which prevent early reduction, snug binding with an elastic bandage before application of adequate splinting will prevent excessive swelling and permit adequate treatment as soon as the patient improves. Sympathetic blocks and elevation are also of value in these cases.

SUMMARY

The observations herein apply in a large measure to all acute joint injuries. Four facts, however, bear re-emphasis.

First, the anatomy of the ankle area gives it many of the features of a closed space. Second, the changes due to excessive hemorrhage are not completely reversible. This is well illustrated by the prolonged and resistant swelling following "simple" sprains. Third, the cancellous bone in this area rapidly softens, and recoalesces by callous formation so that hairline anatomical reduction is extremely difficult. Finally, the function of any joint, particularly the ankle, is dependent on the regularity of its articular surface.

Let me commend to you an early accurate diagnosis of ankle injuries together with the rapid institution of necessary treatment, be it closed or otherwise. Only by treatment along these lines can we hope to decrease the morbidity involved and get the result which will make the patient as normal as possible as soon as possible, and as economically as possible.

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RADIATION THERAPY IN CARCINOMA OF THE CERVIX*

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ALEXANDRIA

The relative five-year cure rate for all cases of cancer of the uterine cervix is 30.9 per cent.[1] This figure is compiled from numerous centers in many countries, and many different methods of using radiation therapy are represented. When one realizes that this figure includes all stages of development from the rarely found cancer-in-situ to the farthest advanced Stage IV, and that Stage III numerically contains the greatest number of patients, one can appreciate the fact that this is an admirable cure rate compared to that achieved in numerous other forms of cancer. The really important point to be gleaned from any perusal of these statistics, however, is that eight out of ten early cases can be cured with adequate therapy.[2]

Adequate therapy in this instance means minute attention to detail above all things. It requires careful pretherapeutic evaluation of the patient, as well as astute intermingling of intracavitary radium and external x-ray therapy. Radium remains the keystone of our treatment, as it is only in Stages III and IV that the addition of external roentgen therapy produces any in-

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crease in the salvage rate,[3] although it is difficult at times to withhold its use from the individual patient because of mass statistics.

The addition of intravaginal roentgen therapy to the armamentarium has produced no increase in results in the early stages, and the cure rate drops to 9.3 per cent in Stage III and 0.0 per cent in Stage IV,[4] as compared to 22.9 per cent and 6.2 per cent with conventional therapy.[1] This method of treatment is not entirely to be disregarded, however, as there are several indications for its use: notably in the situations where there is a large fungating mass occupying the vagina, or where excessive blood loss requires rapid hemostasis. Moreover, it may well be the treatment of choice in cancer of the cervical stump.

MODE OF GROWTH

In order to approach intelligently the treatment of carcinoma of the cervix it is necessary to visualize its pathologic anatomy in three-dimensional terms. This disease is wonderfully uniform in its mode of growth. It involves radially the cervical canal, the face of the cervix, and extends up into the body of the uterus. The fornices are then affected. From there spread occurs distally down the vaginal mucosa and most frequently into the loose areolar tissue between the leaves of the broad ligament. Not all of these points may be affected in any individual patient, but for purposes of treatment (but not staging!) it is safest to assume that they are. This situation is graphically demonstrated in Figure 1.

Anterior spread is blocked temporarily at least by the extremely tough fibers of the vesicovaginal septum. The same situation is present posteriorly where spread in that direction is impeded by the rectovaginal septum.

This means then that the lines of least resistance are followed. The mode of spread is upward, downward, and laterally. We are not concerned in the immediately salvageable patients with possible anterior or posterior spread. Our aim resolves itself, therefore, into delivering a cancericidal dose of radiation to the periphery of a three-dimensional volume which in the coronal plane is three-pronged but is flattened in its anteroposterior diameter. Figure 2 shows this volume to be treated.

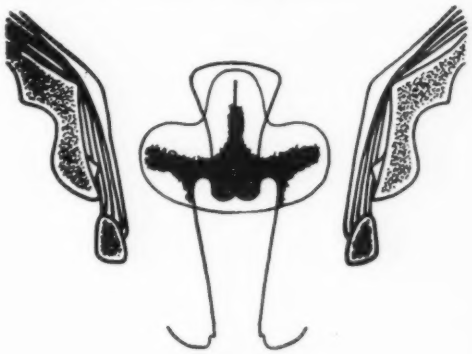

Figure 2

METHOD OF RADIATION

The method of achieving this irregular volume of radiation is a practical application of the physical laws of radium. Figure 3 depicts a linear source of radium, such as

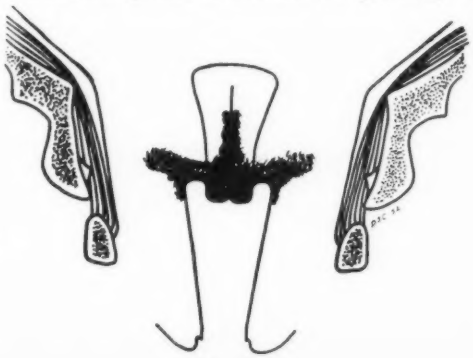

Figure 1

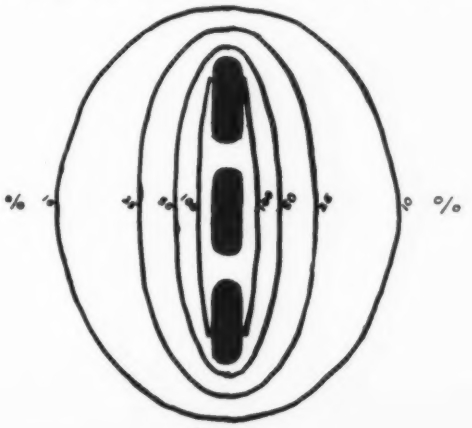

Figure 3

a cervical tandem, along with its pattern of surrounding radiation, represented by isodose lines. Each of these lines connects points where the amount of radiation is equal. Note that the highest concentration of radiation is always on a line extending laterally from the midpoint of the tandem. Note also that the amount of radiation emanating from either end of the tandem is virtually insignificant. It is obvious that such a tandem inserted into the cervix will not produce a pattern of radiation which will coincide with the pattern of the disease to be treated. Moreover, using such a tandem, if a dose is given which is sufficient to produce a cancerocidal effect at the lateral periphery of our disease, it also follows that a similar dose will be delivered to the urinary bladder and the rectum. Such a dose to these organs is not only unnecessary but is very dangerous. Conversely, using such a tandem, if we limit our dose to the bladder and rectum to a safe level, we are failing to deliver an effective dose to the parametria.

Some means must be found then to extend the radiation pattern laterally without adding to the level of radiation anteriorly or posteriorly. This can be accomplished by the addition of radium sources placed in the vagina. These are spread as far laterally as the anatomic conditions will permit, and they must be placed so that their long axes are in an anteroposterior plane. The radiation pattern produced by such an arrangement is shown in Figure 4. Note

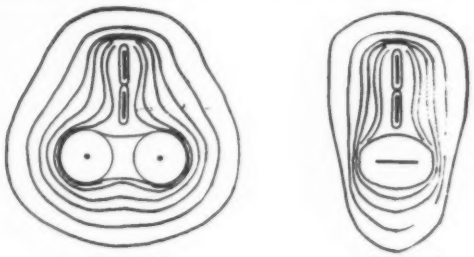

Figure 4

that it fulfills all the criteria that were set up in the discussion of the disease pattern: it is three-pronged in the coronal plane, it extends for an ample distance down the vaginal mucosa, and it is flattened anteroposteriorly. Superimposition of the radiation pattern upon the disease pattern is shown in Figure 5.

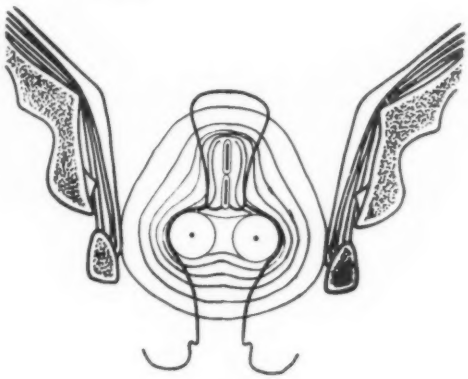

Figure 5

The arrangement of radium sources shown is of course the basic set-up. This arrangement must be varied according to the size of the uterus, the distensibility of the fornices, and the extent of vaginal spread of the disease. Variation in the mechanical arrangement of the radium sources must be accompanied by a compensating variation in the amount of radium placed in each source in order to maintain this basic pattern of radiation. These various arrangements have been worked out in adequate detail and are readily available for study and use.[5, 6, 7]

Various applicators are available which suit the requirements of this mode of treatment. Those devised at the Holt Radium Institute in Manchester, England, afford by far the greatest degree of adaptability. They must be obtained in Britain, however. The colpostat used at the Institut du Radium of Paris fulfills the criteria and is commercially available in this country. Its accurate use though requires rather exacting roentgenographic measurements of the degree of spreading of the vaginal sources, and consequently, their dose contribution to the parametria. The Ernst applicator is a relatively recent American contribution which is satisfactory in many instances. However, it lacks adaptability and fails to maintain sufficient distance between the

vaginal radium and the vaginal wall. Its chief advantage is the fact that it is in one piece which greatly facilitates application and removal.

PRETHERAPEUTIC EVALUATION

The pretherapeutic evaluation of the patient is of the utmost importance. The extent of disease, the patient's age and general physical condition, and the presence of infection are some of the more important matters to be considered. There is nothing to be gained by finding a carcinoma of the cervix among one's office patients one afternoon, rushing her into the hospital that evening, and throwing in some radium the following morning. A simple excisional biopsy can be obtained in the office without anesthesia and without pain in practically every instance. The finding of a squamous cell carcinoma microscopically adequately excludes the possibility of endometrial origin. Treatment can then be planned on a considered, rational basis. Decision can be made as to the sequence of radium and external roentgen therapy, and an arrangement of radium to suit the individual need can be planned.

Certainly this is preferable to the last minute rush in the operating room following a diagnosis of carcinoma from a frozen section, with the instrument nurse fumbling as she hurriedly attempts to make up some form of radium applicator which will fit the need more or less. Not only does this not benefit the patient, but the operator and the entire operating room personnel are needlessly exposed to radiation. The place to make up the applicator is in the radiology department or anywhere else where proper precautions have been set up, and it should be made up according to the specifications determined at the original pelvic examination. It can then be sterilized in advance and brought into the operating room only at the instant it is needed.

It is an established fact that anemia produces an adverse effect upon the radiosensitivity of a tumor.[8] In terms of cancer of the cervix, this means that if the patient's red blood cell count is below 3.0 million, definitive treatment must be deferred until the count can be brought up to at least 3.5 million. This can be accomplished rapidly in two ways. Whole blood transfusions can be given. If there is appreciable blood loss from the tumor, a hemostatic dose of x-rays administered either externally or intravaginally should be considered.

The presence of infection should also be determined at the original examination. Its presence is an indication for preliminary external x-ray therapy, which properly applied, will result in a relatively clean cervix and uterus, rendering the application of radium simpler and more effective. The result in regard to possible morbidity is obvious.

Except for the special indications listed above, the use of external x-ray therapy must be considered as supplementary to the effects produced by intracavitary radium. It is used to bring the radiation dose in the lateral aspects of the parametria up to cancerocidal levels. Its need is evident in all patients classified as Stage III or IV. Its use in the earlier stages must be considered on an individual basis. It should be noted that, inasmuch as bowel sensitivity to radiation rather than skin sensitivity is the limiting factor in roentgen therapy, the higher voltage x-ray machines in this instance have no advantage. Equal results can be obtained using the conventional 200-250 kilovolt machines, which are in common usage. Adequate treatment of carcinoma of the cervix does not require the services of a large medical center.

DOSAGE

No hard and fast rule can be made concerning dosage. The dose to be given depends on many factors. It is influenced by the sequence of radium and external radiation, by the method of their application, and by the rapidity of their application. Age of the patient is a factor in determining dosage also. These many variations place a definitive discussion of dosage outside the realm of this paper, and reference is made to the many excellent and detailed works on this subject.[2, 5-7] One important generalization can be made, however. Any expression of dosage in terms of milligram-hours

means absolutely nothing, unless it is accompanied by a description of the position of each source of radium and the amount of radium in each source. Reference to the foregoing discussion of radiation pattern should reveal the fact that 75 mg. of radium, for example, can be distributed betwen a tandem and colpostats in many different ways, and that each different way of distribution will produce an entirely different radiation pattern. Yet each of these variations left in place for a period of seventy-seven hours results in 5000 mg.-hours of exposure. Dosage must be expressed in terms of the amount of radiation reaching a given point. Otherwise it is meaningless.

CONCLUSION

The treatment of carcinoma of the cervix is a matter for considered judgment and careful evaluation, rather than haste. Attention to detail, as well as the patient's whole problem, will result in making the treatment fit the disease, thereby curing more women.

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EFFECT OF HYALURONIDASE ON PROTECTIVE URINARY COLLOIDS AND ITS SIGNIFICANCE IN TREATMENT OF RENAL LITHIASIS*

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When one considers the physicochemical relationships existing in urine, it is surprising that formation of urinary calculi is not more common. The solubility of some of the stone-forming salts is relatively low, particularly at the pH that may exist in the urine. Urine is a highly saturated solution of extremely complex composition in which the concentration of electrolytes, as well as nonelectrolytes, often exceeds the limit of solubility in pure water. An essential factor in maintaining this mechanism in the normal individual is the presence of sufficient protective urinary colloids.

Among the earliest observations concerning the modification of crystal habit is that of Boyle, 1666,[1] who noted that the normal shape of many crystals is changed by the "addition of other bodies". Rome de Lisle, 1783,[2] showed that sodium chloride grown in the presence of fresh urine formed octahedral crystals. Fourcroy and Vauquelin[3] 1810, produced octahedral crystals of sodium chloride from solutions containing urea. Ord[4-6] was the first investigator to use the term "colloid" in connection with crystallization, although not in its modern sense. Lichtwitz[7] and Schade,[8] 1909, concluded that the unusual solubility of stone-forming salts in the urine depends upon the presence of certain colloids which prevents precipitation, agglomeration and conglomeration of salts and other colloids.

Systematic colloid-chemical studies of

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urine which included surface tension determinations, ultramicrographic examinations, electrophoretic studies and chemical analyses offer definite proof that the urine of individuals with renal calculi is deficient in protective colloids.[9-18]

It is generally accepted, although not definitely established, that kidney stones may result from a crystalloid-colloid imbalance. The development of renal calculi may be brought about either by the growth of crystals from a highly concentrated electrolyte solution, or by the agglomeration of the dispersed phase of inorganic colloids, due to a reduction of their zeta potential in the presence of a high concentration of counter ions. In the presence of hydrophilic colloids, the electrolytes are thought to bring about gelation, thus embedding the inorganic matter in the gel. Stone formation is prevented in the normal individual by sufficient concentration of hydrophilic colloids in the urine. Presumably, the higher the concentration of protective urinary colloids, the less likely is stone formation; the lower the concentration, the greater the possibility of stone formation. The hydrophilic colloid, if capillary-active, acts as a peptizing agent and protective colloid, thereby preventing growth or agglomeration of crystalloids. Thus the use of strong peptizing agents may reduce stone formation.

In patients receiving hyaluronidase for clysis, it was observed that clarification of cloudy, pathologic urines occurred in assocoation with the administration of this enzyme.[10, 11] The clarifying effect usually became manifest within thirty minutes after the enzyme was injected and persisted for twenty-four to seventy-two hours. Since the effect was not produced by the direct addition of hyaluronidase to cloudy voided urine, Seifter[15-17] suggested that hyaluronidase acted indirectly by the release of hyaluronic acid at the site of injection with subsequent excretion in the urine. This hypothesis has been confirmed by Hauser's studies,[12-18] including ultramicroscopic observations that (1) potassium hyaluronate added to voided urine acts as a powerful dispersing or peptizing agent, and that (2) the subcutaneous injection of hyaluronidase, mixed with physiologic sodium chloride solution, results in the release of a protective colloid into the urine which inhibits the formation of new crystalline material and disperses crystalline matter already present. Injection of hyaluronidase thus appears to alter the colloidal state of the urine.

Hyaluronidase is an enzyme having the property of softening hyaluronic acid, the mucopolysaccharide which is an essential component of the intercellular "ground substance" or "cement substance" of tissue. When hyaluronidase is brought into contact with hyaluronic acid, either in the test tube or by subcutaneous injection into tissue, the viscosity of the hyaluronic acid is diminished. Hyaluronidase releases hyaluronic acid at the site of injection, in this case the skin and subcutaneous tissues. The weakened barrier begins to reconstitute itself shortly after the hyaluronidase action has been dissipated. Soon after the time of injection and during the period of repair, excess hyaluronic acid, or a substrate is present in the urine and is excreted in the urine and acts as an excellent protective colloid. The effect of hyaluronidase on the protective urinary colloids and its significance in the treatment of renal lithiasis has been studied in a series of patients previously suffering from rapidly recurring stone formation.

Observations to date indicate that patients vary widely in the quantity of hyaluronidase required to clarify pathologic clouded urine. Such clarification is the most convenient clinical method of determining response to this treatment. The results reported here have been obtained with dosages ranging from 150 turbidity reducing units (T. R. units) subcutaneously two or three times a week, to 600 T. R. units daily. Injection sites were rotated. In the presence of residual urinary tract infection, the hyaluronidase requirements may be increased. (If the hyaluronidase used is standardized in terms of other units, their relation to turbidity reducing units must

be determined. For example, 500 viscosity units are approximately equivalent to 150 turbidity reducing units). The lyophilized hyaluronidase should be reconstituted with sterile saline rather than with distilled water, in the proportion of 150 to 300 turbidity reducing units to 1 cc. of saline. When prepared with strict aseptic precautions, such solutions are stable without refrigeration for two weeks.

The effect of hyaluronidase on urine may be conveniently followed in a series of uncentrifuged specimens taken before and during hyaluronidase therapy. In such a series, the turbidity and sediment usually begin to diminish in specimens obtained about thirty minutes after the injection. When turbidity increases in successive four hour specimens, another dose of hyaluronidase is needed. If no decrease in turbidity and sediment is observed, the dose of the enzyme should be increased and/or given more frequently. As a supplement to this testing procedure, the response may also be studied by comparing the rate of formation of deposits on indwelling catheters during alternate periods with and without hyaluronidase injections. This effect is most pronounced in nephrostomy drainage tubes and least in catheters draining the bladder, with intermediate effectiveness in ureteral catheters. If the urine is initially clear, surface tension determinations, employing the pendant drop method, are used.[19] We have found that the average surface tension of urine in white males and females is approximately 65 and 60 dynes per centimeter, respectively. Following injection of sufficient dosages of hyaluronidase, the surface tension decreases from 8 to 14 dynes per centimeter as long as the effect of hyaluronidase is being maintained. Reduction in surface tension closely correlates the clearing of turbidity and sediment if these are present initially.

An adequate dosage of hyaluronidase is essential for successful therapy because inadequate dosage may result in exact reversal of the intended purpose. If the concentration of protective colloid is insufficient, the crystal nuclei are sensitized and stone formation may be accelerated.

Contraindications to the use of hyaluronidase are sensitivity to the drug and reduced renal function. In the presence of infection or of obstructive uropathy, the usual corrective procedures are carried out and all other methods usually employed for combatting renal lithiasis are utilized.

Hyaluronidase therapy has been used in 24 patients suffering from rapidly recurring renal calculi. They had passed numerous stones at regular intervals over a period of years or new stones were developing within a period of weeks or a few months. No form of treatment had been effective in reducing the formation or recurrence of stone before hyaluronidase was used. Dosages used were 150 to 600 turbidity reducing units, repeated on the average of twenty-four to seventy-two hours. In 19 patients, no new stone formation or increase in size of existing stones occurred during a period of eleven to twenty-one months, as demonstrated by x-rays taken at thirty to sixty day intervals. In 4 of the 24 patients, there was evidence of reduction in size and density of the stones. In 1 case, there was complete disappearance of multiple, bilateral small calyceal stones. Generally, the smaller the stone initially, the more effective hyaluronidase therapy is in preventing its growth.

Protective colloids, like hyaluronic acid, which pronouncedly reduce interfacial tension, will not only coat the surface of matter, but also have the tendency to penetrate into any available interstices. In so doing, they will then be adsorbed on the surface of those agglomerated particles, and due to their hydration, as well as their electric charge, tend to overcome the Van der Waals forces and push the particles apart. The peptizing action of some protective colloids is the result of the fact that they not only reduce the surface or interfacial tension, but also impart charges on the surface of the particles to be peptized.

There is also another factor which is very important in reduction in size and density of stone following hyaluronidase therapy. Benjamin, et al,[20] used radio-active phosphorus (P_{32}) to study phosphate exchange between urine in the renal pelvis and renal

calculi containing phosphate as PO_4. Following administration of radio-active phosphorus, it was found that a highly radio-active phosphate passed by the non-active phosphates from the urine replacing non-active phosphate on the surface of the stones. This lowers the specific activity of the newly-formed urine reaching the renal pelvis and imparts radio-activity to the stones. Later as the activity of the newly-formed urine falls below the activity of the stones, the reverse process takes place, the stones contributing radio-active phosphates for the nonisotopic phosphates, and thus producing an elevated activity. If precipitation of salts onto the stone can be prevented, and the concentration of salts in the urine kept low, then the release of salts from the stone will reduce its size and density.

Only hyaluronidase therapy was used when attempting to determine the effectiveness of this drug alone. Now again, we employ all of the usual accepted measures for combatting stone formation. In a small group of patients, we have found basaljel to be a distinctly beneficial adjunct in the treatment of stone when the patient is receiving hyaluronidase. Small doses of basaljel, two teaspoonfuls four times a day, will moderately reduce the phosphorus excretion in the urine; however, the reduction is not such that there will be a compensatory rise in the calcium output.

It has been observed in 10 of the 24 patients (40 per cent) who received large doses of hyaluronidase (300 to 600 T.R. units daily) for a period of several months, that their skin becomes softer and smoother and the subcutaneous tissue more pliable. This is due to a vast increase in hyaluronic acid, an essential component of the "ground substance", which is being produced as a result of hyaluronidase administration.[17] Finally, it has been observed that patients who receive large doses of hyaluronidase for a period of months have a sense of well being which cannot be ascribed solely to a general improvement in health. The cause for this is being further investigated and no conclusions can be reached at this time. Prolonged administration of hyaluronidase does not alter the total twenty-four hour urinary output and there is no change in the sodium, chloride, or potassium excretion.

SUMMARY

The abnormal solubility of stone-forming salts in the urine is largely a consequence of the presence of certain protective colloids. When the protective colloid is insufficient, urinary crystals are "sensitized" and stone formation begins or is accelerated. Parenteral injection of hyaluronidase, mixed with physiologic saline, pronouncedly increases the protective urinary colloids. Methods of determining the protective urinary colloids are outlined and a regime of hyaluronidase therapy for stone formers is presented. The average dosage of hyaluronidase ranges from 150 to 600 turbidity reducing units every twenty-four to forty-eight hours. Hyaluronidase therapy has been effective in preventing calculous formation or reformation during a period of fourteen to twenty-four months in 19 of 24 patients, who had previously formed stones at a rapid rate.

CONCLUSIONS

The implication of each of the many different factors responsible in stone formation remains intensely controversial as demonstrating a single cause. Perhaps failure to reach accord is the fact that we have placed too great emphasis on the pleomorphism of stone and failed to recognize a more basic biopathological mechanism as it comes into play in each case. Thus, we must revert to the concept that calculous disease is only one of the many types of crystalloid-colloid deposition in human organs. Renal calculus is not a disease entity, per se, but represents a variable physical form of concrement building, which may result from an equally variable type of pathology regardless of its location in the body.

The phenomenon of releasing hyaluronic acid, an essential component of the "ground substance," at the site of injection by hyaluronidase and subsequent production of large amounts of hyaluronic acid with ex-

cretion into the urine, has proven to be a very helpful adjunct in treatment of renal lithiasis. Also it opens a new field for further research into the stimulatingly interesting and highly important field of the intercellular "ground substance".

Addendum—Since presentation of this paper, we have found that larger doses of hyaluronidase, 300, 600, 900 T. R. units daily, are more effective than previously prescribed dosages.

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THE VALUE OF BRONCHOGRAPHY*

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Bronchography, or roentgen-ray examination of the bronchial tree after the injection of a contrast medium, has long had an important place in the diagnostic armamentarium of the radiologist. Whereas many thoracic lesions present a characteristic appearance in the plain roentgenogram of the chest, there are others of a more obscure nature which require bronchography for accurate diagnosis. Among these are many suppurative and neoplastic lesions. With the recent advances in thoracic surgery, bronchography is today assuming ever increasing importance. Lobectomy, pneumonectomy and the recently developed segmental lobar resections have made accurate localization of thoracic lesions imperative. No longer can we be content with instilling a small amount of lipiodol into the bronchial tree and focusing our attention entirely on the lesion in question. The diagnostic value of bronchography is well appreciated but its contribution to the therapeutic approach to the lesion has not been sufficiently stressed. It has become necessary to outline the entire bronchial tree with lipiodol in order to help the surgeon plan the type or extent of resection in those patients with thoracic diseases amenable to surgical treatment.

TECHNIQUE

The technique used in obtaining bronchograms is of utmost importance. Several methods have proved satisfactory and each investigator advocates the method with

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which he has had most success. In my experience with over 1000 bronchograms, the intratracheal catheter method has proved most satisfactory. It permits visualization of the entire bronchial tree rather than just several parts. Moreover, it can be performed quickly and without significant discomfort to the patient.

As in any method, it is an absolute essential, in using the intratracheal catheter method, to secure as complete anesthesia as possible; this cannot be overemphasized. It can be stated with almost equal truth that poor bronchograms are due mainly to inadequate anesthesia.

The patient is given 1½ grains of seconal; this allays nervousness and acts as a specific prophylactic antidote to cocaine hypersensitivity. Postural drainage is then instituted to relieve the bronchial tree of as much secretion as possible. About one hour after administration of the seconal the oropharynx and laryngopharynx are carefully sprayed at intervals with a solution of 1 per cent tetracaine (pontocaine) to which 1:1000 epinephrine has been added. The anesthetic solution is finally dropped on the vocal cords and into the trachea. The involuntary cough reflex is thus abolished so that the catheter can easily be passed through the nasal fossa and glottis into the trachea. The patient then lies on the roentgenoscopic table, and under direct fluoroscopic vision lipiodol is injected while the catheter is being manipulated into the proper bronchial divisions. During the procedure the patient is rotated in many positions to insure proper filling of all the bronchial divisions, anterior as well as posterior, upper lobes as well as lower. About 20 cc. of lipiodol is all that is required. More would produce flooding of lipiodol in the alveolar spaces which would not only obscure the bronchial tree but also favor retention of the oil for a longer period of time. This could make interpretation of future follow-up roentgenograms troublesome. The bronchial tree is filled with lipiodol as quickly as possible; roentgenograms are then made in the posteroanterior, and right and left anterior oblique views, preferably with the patient in the erect position at 6 feet. A Bucky diaphragm is used for greater clarity. The resultant three bronchograms are sufficient for detailed study in several planes of the entire bronchial tree.

NOMENCLATURE

The problem of correctly naming the tracheobronchial subdivisions has become increasingly important as techniques of bronchography and pulmonary resection have appeared and improved. Adams and Davenport[1] proposed a classification designed to meet the practical needs of internists, radiologists, bronchologists, and surgeons. Jackson and Huber[2] have also suggested a classification of practical interest. Regardless of the classification used, the radiologist, internist and surgeon should have a common knowledge of one classification to use for a working basis.

THE NORMAL BRONCHOGRAM

The normal bronchogram shows bronchial divisions which possess a smooth contour with uniform but almost imperceptible diminution in caliber as the bronchus progresses from the main trunk to the small bronchioles at the periphery of the lung (Figs. 1 and 2.) Di Rienzo[3] has dem-

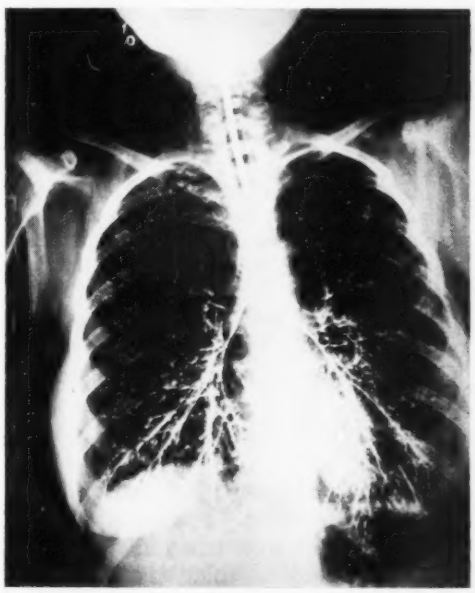

Figure 1.—Normal bronchogram in posteroanterior projection.

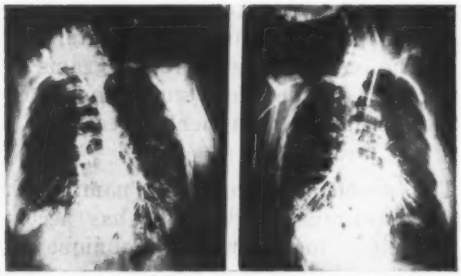

Figure 2.—Normal bronchograms. (A) Left anterior oblique view. (B) Right anterior oblique view.

onstrated that occasionally if the area has not been completely anesthetized or if a patient is asthmatic, the lipiodol will act as an intrabronchial foreign body which intensifies the tone of the elastic and muscular fibers surrounding the bronchus producing sphincters at the point where the bronchial branches originate. This is sometimes interpreted incorrectly as being due to an organic contraction and explains many cases of reversible bronchiectasis (Fig. 3).

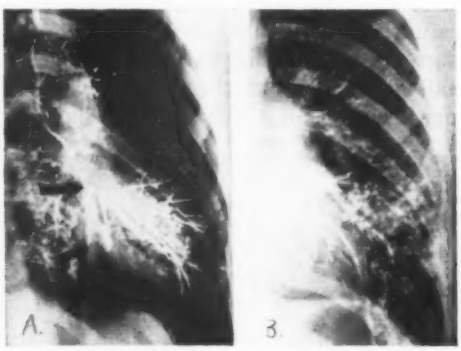

Figure 3.—(A) Transient bronchospasm resembling bronchiectasis. (B) Same patient at a later date without bronchospasm and showing no bronchietasis. Epinephrine was injected prior to the second examination.

Some Applications of Bronchography

With the picture of an adequate and normal bronchogram in mind, it becomes easy to detect abnormalities that appear in the bronchial tree. *Bronchiectasis* is the most commonly encountered pathologic alteration in bronchograms. The bronchial divisions are dilated and many divisions are beaded or possess saccular dilatations due to destruction of portions of the bronchial wall. As important as the diagnosis is determination of the extent of the bronchiectasis. Properly made bronchograms will accurately localize the disease and thus establish which lobes or segments of lobes need be removed. Physical examination is notoriously unreliable in revealing the extent of bronchiectasis; signs may be entirely lacking except in the most grossly involved areas. Routine roentgenograms are equally ineffectual in localizing the bronchial dilatations. Figure 4 illustrates the extent of bronchiectasis in a man aged 45 years, who had a severe productive cough for twenty-seven years. In this instance the lingular division of the left upper lobe and the left lower lobe were involved. Obviously, if poorly made bronchograms had shown bronchiectasis in the lower lobe only, owing to nonfilling of the lingula, left lower lobectomy would have failed to cure the disease, producing at best amelioration of the symptoms. Myers and Blades[4] reported that in 57 per cent of the patients with left lower lobe bronchiectasis the lingula of the left upper lobe was also diseased. Likewise, right middle lobe bronchiectasis was demonstrated in 59 per cent of right lower lobe bronchiectasis. Figure 5 illustrates upper lobe bronchiectasis with normal lower lobes showing the need for always filling the superior bronchial tree as well as the inferior.

Figure 4.—Upper arrows show bronchiectasis of lingular division of left upper lobe. Lower arrow points to bronchiectasis of divisions of left lower lobe.

Dormer and associates[5] have emphasized the value of bronchography in *pulmonary tuberculosis*. They observed that in pa-

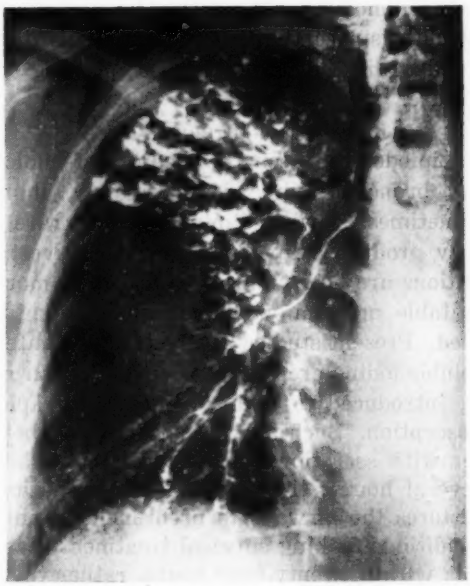

Figure 5.—Saccular bronchiectasis confined to divisions of right upper lobe bronchus. This demonstrates need of filling upper lobes as well as lower.

tients with positive sputum whose plain roentgenograms showed nothing abnormal or were questionable the bronchograms would nearly always indicate the early tuberculous lesion as bronchiectasis or a dilated bronchus terminating in a cavity.

Gordon and coworkers[6] considered bronchography a valuable aid in planning surgical treatment of pulmonary tuberculosis. For example, when thoracoplasty is considered, bronchography will provide information which proves helpful in deciding how extensive a procedure should be planned. Bronchograms frequently show evidence of pronounced structural changes in areas where "clearing" has taken place as interpreted in routine roentgenograms of the chest. Without evidence of these structural changes, the surgeon might not do a thoracoplasty which is extensive enough; as a consequence, an unsuccessful result will be obtained. Also, when decortication is considered to allow a "non-reexpansible" lung under pneumothorax to expand once more, bronchography gives the best information available as to the extent of the structural changes present in the collapsed lung and thus helps the surgeon decide whether the lung is healthy enough to make decortication advisable.

A *pulmonary abscess* cavity is not easily filled with lipiodol because of the presence of secretions and swelling of the mucosa of the bronchial division leading to the abscess. However, demonstration and identification of the blocked bronchus will indicate the exact segment of the lung in which the abscess is located. It has been pointed out by Myers and Blades that bronchography is of prognostic value in chronic abscess of the lung. The longer the duration of the abscess, the greater is the likelihood of development of secondary bronchiectasis. The coexistence of bronchiectasis and pulmonary abscess, recognized only when lipiodol is used, renders complete symptomatic cure following simple surgical drainage less likely and the probability that lobectomy may eventually be required is at once suggested.

Intrabronchial tumors may be easily diagnosed by bronchoscopy if they are in the larger bronchi but if they are in the smaller bronchi beyond the reach of the bronchoscope, bronchography is again valuable in demonstrating the bronchial block or deformity. Figure 6 illustrates such a case in which bronchogenic carcinoma infil-

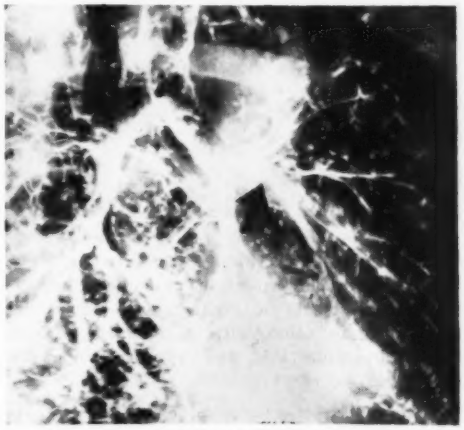

Figure 6.—Arrow points to minor irregularity of proximal portion of lingular division in a patient who had hemoptysis for three weeks. It represented a carcinoma infiltrating the bronchial wall which was beyond the reach of the bronschoscope.

trating the wall of the proximal portion of the lingular division of the left upper lobe produced a minor irregularity; this suggested the correct diagnosis whereas the lesion could not be seen through the bronchoscope because of its distal position. Intraluminal tumors, if large enough, will produce atelectasis, abscess, bronchiectasis, pneumonitis or obstructive emphysema distal to the obstruction (Fig. 7). Bronchography will indicate whether or not an intraluminal tumor is the cause of such alterations.

Figure 7.—Occlusion of intermediate bronchus on right by intraluminal carcinoma. The triangular shadow at right pulmonary base is due to atelectasis of right middle and lower lobes in association with pulmonary abscess, chronic bronchiectasis, and organizing pneumonitis.

Occasionally, it will be difficult to determine whether a large mass seen in a roentgenogram of the chest is intrapulmonary or extrapulmonary. The latter type of mass would displace the bronchial tree, as outlined by lipiodol, away from it, proving its nature.

THE FUTURE

Lipiodol has been the medium of choice for bronchography. Unfortunately, it is sometimes slowly eliminated and rarely may produce a lipoid granuloma. Investigations are now under way to find a more suitable medium which is rapidly eliminated. Present studies revolve around water soluble iodine preparations, such as ioduron B, introduced to take advantage of rapid absorption. Such a preparation mixes better with secretions. It is absorbed within several hours; the rapidity of elimination restores the airways to prebronchographic conditions making surgical treatment feasible within twenty-four hours, rather than the interval of several days or weeks required after injection of lipiodol. Being hypertonic, ioduron B is more irritating than lipiodol and less opaque to the roentgen ray. If such a water soluble medium can be made less irritating, it will hold great promise for the future.

CONCLUSIONS

Bronchography has proved of definite value not only in the diagnosis of many suppurative and neoplastic diseases of the chest but also in determining the precise location of a lesion amenable to surgical treatment. In this way, it has provided information which helps the surgeon plan his procedure beforehand. The success of bronchography depends upon a good technic which will provide adequate visualization of the entire bronchial tree. Present investigations to develop a more satisfactory opaque medium for bronchography appear to have great promise for the future.

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ROLE OF THE PRIVATE PHYSICIAN IN TUBERCULOSIS CONTROL

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The control of tuberculosis depends largely upon two major activities: research and medical education. It is the opinion of many observers that medical education is woefully lacking in a large number of medical colleges. Research on tuberculosis received a boost in the past two years by receiving 1 per cent of seal sale money as a direct allocation. The success of research is assured by a solid organization and adequate support. A program for medical education is most desired and must be strengthened by the personal efforts of *each of you* interested in tuberculosis control.

MEDICAL SCHOOL EDUCATION ON TUBERCULOSIS

Why have the authorities in charge of medical colleges been at least reluctant, if not actually negligent, in the omission of a good course of instruction on tuberculosis in the curricula? Is it the fault of people like those in this audience? Have we decreased their interest by overemphasis on declining death rates and so forth? Is it primarily the fault of the Deans of Medical Colleges?

Our medical research program is greater in import, scope, and effectiveness than that of medical education. It is our duty to correlate the research information with that of education. Within the past few years progress in the refinements of diagnosis, and the methods of treatment of tuberculosis have been rapid and significant. Progress must continue if we are to control tuberculosis. As changes take place and our course of treatment is altered, new procedures are introduced. To quote Dr. John H. Skavlem on the up to date information that is needed:

"Our medical education program has not kept abreast of our program in medical research. Within the past ten years, the advancements in the refinements of diagnosis and the methods of treatment of tuberculosis have been rapid and significant. Such changes will continue. The older methods are being altered or changed in importance and new procedures are introduced. The medical students and the physician, be he teacher, research worker, general practitioner, or specialist, must be kept authoritatively informed of the progressive changes. For example, the present day usage of pneumothorax, pneumoperitoneum and phrenic nerve paralysis; the importance and place of the tuberculin test; and judicious use of BCG; the necessity and choice of surgical procedures, such as thoracoplasty and resection, are all questions of pressing significance. The answer to such questions are changing from year to year and month to month as research contributes new knowledge and experience. The physician should and does look to the American Trudeau Society for rules and guidance, because we as an organization sponsor and promote the largest program of research in tuberculosis in the world. We cannot be deficient in our program to spread and guide the knowledge given by such research."

Would it not be a policy of wisdom for the local tuberculosis association, and the local and state medical societies to assert themselves and urge the medical colleges to endeavor to teach a good course in the diagnosis and treatment of tuberculosis?

Medicine and surgery offer so much in modern treatment of tuberculosis. Never before have there been the many and varied opportunities for the local tuberculosis association to team up with the other community organizations such as the medical school, hospital, and local medical societies. It is so evident they have much to offer each other.

In these changing times these kindred interests must work together if they are to hold public confidence and continue to do effective work. I maintain that until every graduate of medicine has some basic working knowledge of tuberculosis, a control program is almost static. Every doctor, be he specialist, or not has a place in a control program. He *must* get his fundamentals in the medical school.

For every medical student to gain this

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knowledge that we discuss, ways and means of supporting an expanding program of medical education should be studied. Now is the time, and the place is very obvious. Of course, the needs vary in different localities. The urgency and importance of obtaining aid in the solution of this problem should be an incentive, also good reason for obtaining the support of local tuberculosis associations, medical societies, and medical colleges.

ROLE OF THE FAMILY DOCTOR

A program to educate doctors is legitimate, it is logical, and should be a choice of activity. Let me repeat a quotation from Dr. Herman E. Hilleboe:

"The average patient has a great deal of confidence in his private physician, and expects him to treat tuberculosis much as he would accept other family emergencies. Psychological factors make this desirable, and practical considerations make it feasible, especially if this physician possesses sufficient broad understanding of tuberculosis and modern therapeutic methods. Sanatorium care is no longer the only method of tuberculosis control. Many minimal lesions and a limited number of inactive advanced lesions are amenable to out-patient supervision under strict medical care. This supervision and care can often be rendered by the alert general practitioner who possesses modern knowledge of the diagnosis and treatment of tuberculosis."

To again emphasize the great importance of the role of the family doctor in tuberculosis control, your attention is directed to the various groups of patients that could and do come under his care.

First—The ever increasing numbers on the waiting list for admission to the sanatorium.

Second—The group that is discharged with consent and are in need of further treatments and follow-up care.

Third—That much too large contingent that leave the sanatorium against advice, but must be treated.

Fourth—Those that refuse to enter hospitals for various reasons.

Fifth—Those rejected for various reasons, as hopelessness, old age, and so forth.

Sixth—Those patients that are diagnosed by the family doctor.

A working knowledge of diagnosis and treatment, good judgment and discretion by the family doctor may often prevent a catastrophic result. For instance, the period of two to eight weeks waiting period may mean life or death depending on advice given by the family doctor. If the physician is qualified, or refers patient to the specialist, he may institute the proper collapse procedure. He may judiciously use chemotherapy, especially in hemoptysis and other severe complications requiring active treatment. The advantage of such care is very manifest in the response achieved in many cases. It fills the gap of time with action, which every one sick needs and desires.

CONCLUSION

It is our anticipated hope that the knowledge acquired by research will be to promote the dissemination of knowledge into useful effective channels of practice. This will aid the student who graduates in medicine. When proper facilities are available and used to promote postgraduate education for the family doctor and general practitioner of medicine they will have reached a pinnacle in the control of tuberculosis. Those of us that spent our efforts will have the satisfaction and knowledge that the goal of control of tuberculosis has been approached, if not obtained, to the fullest extent. To quote H. McLead Riggins:

"Thoughtful, determined, and cooperative effort by medical educators and tuberculosis associations can remedy the flaws in medical education in tuberculosis."

———o———

THE FIELD OF GENERAL PRACTICE

PAUL WILLIAMSON, M. D.

MEMPHIS, TENNESSEE

With renewed interest in the general practitioner becoming apparent in all segments of American Medicine, the field of general practice becomes a consideration for definition. Just what shall the general practitioner do? Just how far shall he go in the care of patients? This, of course, must remain an individual matter and depends very largely upon individual training. One fact, however, that is frequently missed in discussing such a problem is the fact that 80 per cent of diseases prevalent

in America today are of simple, uncomplicated nature and respond well to exhibition of the remedies known to all physicians.

PSYCHOSOMATIC ASPECT OF GENERAL PRACTICE

One should admit that the majority of diagnoses are easily made. There is a third factor, too, that becomes important in considering the field of general practice. Many people come to their physician for relief of fear and relief of worry. No thinking physician who has had experience in practice would deny for a minute that the majority of American medical practice is psychosomatic. To those of us who have spent a few years dealing with the public, the term "psychosomatic" frequently takes on a connotation akin to "worried people."

In the writer's own general practice, approximately 60 per cent of the patients seen had little or no organic pathology but the problems of everyday living; the problems that occur to all of us during our lives, were the things that brought them to the doctor. They sought not organic medical care but friendship and understanding and appreciation of their problems.

If these facts be true—and they are nearly universally agreed upon—then the field of the general practitioner encompasses from 80 to 90 per cent of the medical problems of any community. Any physician worthy of the name will refuse to care for disease beyond his ken and will seek the advice of better trained men whenever necessary. It is, however, an undeniable fact that young men have been encouraged to seek help perhaps too much. In the training of physicians we have frequently emphasized the organic, the difficult, the complex, the unusual, to the point where the physician comes to doubt the very existence of the simple, the everyday entities of general practice. The writer does not mean that a physician will doubt these entities after having been in practice. Referral here is to young and recently graduated physicians.

FEAR OF GENERAL PRACTICE

At the University of Tennessee where an intensive undergraduate program is now being carried on for the purpose of training young men for general practice, we have come to believe that the average student shuns such practice not because he does not like the conditions under which the general practitioner works, but because he is afraid that he is not capable adequately to care for the population of the small town. This, we believe, is not true.

All too frequently, the young man enters the small town afraid of the implications of practice and afraid to trust his own judgement. By the very nature of such practice he is forced to trust his own judgement; he is forced to trust occasionally his surgical technique and he finds that the results are quite good. Then, all too often, he lets all bars down and tries anything and everything. This is not proper and should not be condoned by the medical profession, but we believe it is less the fault of the young man than the fault of his training.

RETURN OF THE FAMILY DOCTOR

Fortuitously, most of the more progressive medical schools of the United States are beginning intensive programs to fit the young man for general practice in rural communities. It would be the contention of all of us that the field of general practice offers more service opportunities to the young doctor than any other field. It has been statistically proven that the worst served area is that area in which no general practitioner is located, and it is being proven daily that the American public demands return of the family doctor. This is not to say that the public demands the standards of medical care that existed thirty years ago, but that they demand the relationship that existed between the family doctor and his patients.

This relationship is difficult of analysis. There are probably no words which can explain the deep and abiding trust and affection that has existed and sometimes exists today between the family doctor and his patients. This ephemeral quality has been and probably will continue to be the greatest reward for the physician. We believe that young men should be taught that their greatest opportunity to serve the pub-

lic lies in this field of general practice and the family doctor relationship.

Several means have been adopted with the view of accomplishing this including the preceptorship and including the general practice clinics of the University of Tennessee. There can, of course, be no agreement as yet as to which means of instruction is best. As a matter of fact, doubt might even be cast that it is possible in any brief period of time to teach a man how to be a doctor. Nonetheless, definite progress has been made and it is our belief that further advance should be encouraged.

CRIMINAL ABORTION*

VINCENT A. CULOTTA, M. D.
NEW ORLEANS

Because of the number of criminal abortions admitted to Charity Hospital, our interest has been aroused in the complications, morbidity, and mortality in induced abortions. There has been no recent paper dealing with criminal abortions per se except for occasional case reports or as a subtopic of other studies of abortions.

The legal definition of criminal abortion in the State of Louisiana is as follows: Abortion is the performance of any of the following acts, for the purpose of procuring premature delivery of the embryo or fetus: (1) administration of any drugs, potions, or any other substance to a pregnant female; or (2) use of any other means whatsoever on a pregnant female.

MATERIAL

This paper deals with the criminal abortions admitted for treatment on the Louisiana State University Gynecological Unit of Charity Hospital for a period of forty-eight months, ending December, 1951. Since a history of instrumentation or interference is often difficult to obtain, the incidence of criminal abortions cannot be inferred from this study. This study necessarily includes suspected as well as admitted criminal abortions. (Table 1).

TABLE 1
TYPES ACCORDING TO COLOR IN 581 ABORTIONS JANUARY 1, 1948, THROUGH DECEMBER 31, 1951

TYPES	NEGRO	WHITE	TOTAL
Spontaneous			
Nonseptic			
Incomplete	208	143	351
Complete	39	21	60
Septic			
Incomplete	45	29	74
Complete	11	4	15
Criminal			
Nonseptic	10	14	24
Septic	18	25	43
Suspected Criminal			
Nonseptic	2	3	5
Septic	8	1	9

Of the total number of patients admitted for abortions, 13 per cent were criminal.

Previous Pregnancies: The data indicate that most of these abortions were induced during the third, fourth, and fifth pregnancies. The distribution of parity of criminal abortion is shown in Table 2. Of the entire series of 80 cases, 42 were white and 38 were colored.

TABLE 2
PARITY OF CRIMINAL ABORTIONS

Primigravida	9
Secundigravida	14
Tertigravida	12
Quadrigravida	24
Grandmultipara	21

Duration of Gestation: Most of the criminal abortions (81 per cent) were induced during the first trimester of pregnancy. The duration of gestation in weeks is shown in Table 3.

TABLE 3
INCIDENCE OF CRIMINAL ABORTIONS ACCORDING TO WEEKS OF GESTATION

WEEKS OF GESTATION	NUMBER	PER CENT
4	6	7.50
6- 8	33	41.25
8-12	26	32.50
12-16	7	8.75
16-20	5	6.25
20-24	3	3.75

Type of Instrumentation: About two-thirds of the abortions were induced with a catheter, pack, or both. In no patient was the criminal abortion induced by a physi-

*Presented at the Seventy-second Annual Meeting of the Louisiana State Medical Society, Shreveport, April 30, 1952.

From the Department of Obstetrics and Gynecology of Louisiana State University School of Medicine, and Charity Hospital of Louisiana at New Orleans.

cian. Fifty-five were performed by midwives and 11 were self induced. Of the latter, 7 were white and 4 were colored cases. The numerous devices used to induct abortions are shown in Table 4.

TABLE 4
TYPE OF INSTRUMENTATION—SELF INDUCED OR ASSISTED

Type	Number
Catheter, pack or both	47
D & C	3
Slippery elm	4
Plastic needle	1
Wire & lysol douches	1
Syringe	1
Type unknown	9

Duration of Illness Prior to Admission: Fifty-five cases (69 per cent) were admitted for treatment within forty-eight hours after instrumentation as shown in Figure 1.

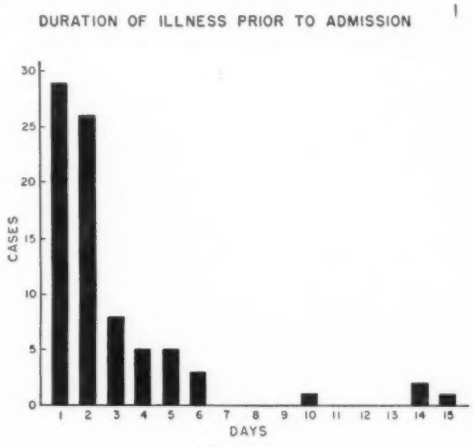

Figure 1

Sepsis: Fifty-one cases or 64 per cent were septic. The criterion for sepsis was a temperature of 101° F. at any time or a temperature of 100.4 on any two successive days.

Anemia: Twenty cases, or 25 per cent, had hemoglobin or hematocrit below 10 gms. per cent or 30 mm., respectively, on admission. Forty patients (50 per cent) required blood transfusions in amounts ranging from 500 cc. to 4000 cc., as shown in Table 7.

TABLE 5
BLOOD AND CERVICAL CULTURES

	Total Cultures	Positive	Negative
Blood	47	11	36
Cervix	33	28	5

TABLE 6
ANTIBIOTICS AND CHEMOTHERAPEUTIC AGENTS

Agents	Number
Sulfonamides	55
Penicillin	67
Streptomycin	41
Aureomycin	10
Terramycin	1
Chloromycetin	3

The most commonly employed combinations were penicillin and sulfonamides; penicillin and streptomycin; and sulfonamides, penicillin and streptomycin.

TABLE 7
BLOOD TRANSFUSION

Amount	Number
500 cc.	14
1000 cc.	15
1500 cc.	4
2000 cc.	3
3000 cc.	3
4000 cc.	1

Complications: The complications of criminal abortions are hemorrhage and sepsis and decretory conditions thereof as shown in Table 8.

TABLE 8
COMPLICATIONS

Type	Number of Cases
Pelvic peritonitis	8
Pelvic cellulitis	7
Cul-de-sac abscess	3
Perforation of uterus	2
Tubo-ovarian abscess	1
Subhepatic abscess	1
Suppurative pelvic thrombophlebitis	1
Thrombophlebitis of lower extremity	1
Pulmonary infarct	1

Surgical Intervention: Nine cases or 10.1 per cent required some type of surgical intervention. Five cases required dilatation and curettage because of persistent excessive bleeding. Two of these dilatation and curettage were done by physicians prior to admission. As a rule dilatation and curettage is not done in infected patients until the signs of sepsis have subsided and then only if the bleeding is severe. There were 4 other cases which required surgical intervention; the first case required a colpotomy; the second case an extraperitoneal drainage; the third case in-

cision and drainage of subhepatic abscess; and the fourth case a ligation of the inferior vena cava and ovarian veins for a suppurative pelvic thrombophlebitis.

Duration of Hospitalization: Sixty-two patients were discharged within five days—the shortest duration being one day and the longest, fifty-eight days.

MORTALITY

In this series of 80 cases there were 4 deaths, making the mortality rate 5 per cent. It is interesting to note that these 4 deaths comprise all of the deaths from all types of abortions during period of this study. (Table 1)

Case No. 1: Admitted in 1948, in shock, one day after instrumentation, with a letter from a physician that a curettage was done because of excessive bleeding. An exploratory laparatomy was done because of blood obtained from a cul-de-sac puncture. The uterus was found to have two perforations on the posterior surface and there was serosanguineous fluid in the abdomen. The patient died twenty-four hours after admission. Cause of death was diffuse generalized peritonitis, bronchopneumonia, and septicemia.

Case No. 2: Admitted in 1949, two days after instrumentation, died twenty-five hours after admission. Cause of death was perforation of the uterus with intra-abdominal hemorrhage and septicemia.

Case No. 3: Admitted in 1949, two days after instrumentation, died ten hours after admission. The cause of death was *E. coli* septicemia and circulatory collapse.

Case No. 4: Admitted in 1951, six days after instrumentation, died ten hours after admission. The cause of death was septicemia, pneumonia, and acute hepatitis.

TREATMENT

In accordance with staff policy all criminal abortions are admitted to the hospital. After the admission history and physical examination, the vagina is inspected under sterile conditions with bivalve speculum; any pieces of tissue or blood clots in vaginal canal are removed; those in the cervical canal are extracted gently with sponge forceps—the cervical canal is not entered except to obtain a cervical culture. In addition to complete blood count and urinalysis, blood cultures and cervical cultures are taken. All cases routinely have chest x-rays for pneumoperitoneum or pulmonary diseases including infarcts or pneumonia and also for future reference should any complications arise at a later date. Oxytocics, usually ergotrate and pitocin or pituitrin, are given intramuscularly.

Mixed serum (tetanus and gas bacilli antitoxin) is given intramuscularly to all patients. None of the cases in this study had or developed tetanus or Welchii infections. Those patients who were in shock or anemic received blood transfusions. Curettage is reserved for those patients who continue to have persistent excessive vaginal bleeding. The most commonly employed chemotherapeutic and antibiotic agents were sulfonamides, penicillin and streptomycin.

Bacteriological studies are very important because the offending organisms can be identified and the proper drug instituted as determined by sensitivity studies.

DISCUSSION

Inasmuch as the four deaths discussed have been associated with septicemia, it is obvious that the number one cause of death in criminal abortion is still sepsis, and more specifically, overwhelming septicemia. In an effort to attack this problem more rationally, we emphasize the need for bacteriological studies. Cervical and blood cultures should be done on admission to obtain the offending organisms, and the drug of choice should be determined by sensitivity studies. With the newer intravenous antibiotics (terramycin and aureomycin) it is possible to obtain immediate therapeutic blood levels. Such therapy might have prevented at least 2 of the deaths discussed.

All patients should be given mixed serum. None of our cases developed tetanus or Welchii infections.

Patients admitted in shock or with anemia should be transfused immediately with whole blood to combat the shock, anemia, and infection. Fifty percent of the cases reviewed required blood transfusions.

The complications incident to instrumentation are perforation of the uterus, intra-abdominal hemorrhage, peritonitis, pelvic cellulitis, cul-de-sac abscess, tubo-ovarian asbscess, subhepatic abscess, suppurative pelvic thrombophlebitis and pulmonary emboli. Whenever the infection localizes and points, proper surgical drainage is necessary. One patient developed a sup-

purative pelvic thrombophlebitis which was successfully treated by ligation of the inferior vena cava and ovarian veins. Only 2 of our cases received dicumarol, the first for a thrombophlebitis of the lower extremity, and the second, prophylactically.

It is very distressing to note that the majority of abortions were induced in the third, fourth, and fifth pregnancies. Similar observations have been made by Collins and others. Only 9 of the 80 patients attempted interruption of their first pregnancy. All of the deaths occurred in women who had families of several living children, in 2 the abortion was attempted for the eighth gestation.

SUMMARY

In spite of the moderate advances in medicine, criminal abortion is still an extremely hazardous undertaking for the pregnant woman. Of 80 patients admitted to Louisiana State University Gynecological Unit of Charity Hospital 4 died. Most of these women have had several children. Only 10 per cent were primigravida. The major problem continues to be sepsis, particularly overwhelming septicemia.

Instrumentation and perforation of the uterus, whether done by the abortionists or by the physician called to care for the patient, is also a hazardous procedure.

In the future increased attention must be given to bacteriological studies of the offending organism so that prompt and proper antibiotic therapy can be instituted.

REFERENCE

1. Louisiana Criminal Code, Art. 43, 1942. Amended regular session, 1948, Art. 87, Sect. C.

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POSTPARTUM ECLAMPSIA*†

HOWARD J. TATUM, PH. D., M. D.

NEW ORLEANS

Postpartum eclampsia is a relatively rare complication of pregnancy. For this reason there are limited critical data in the literature concerning this disease, and those reports which are available consist primarily of individual cases.

Because of the large obstetric service in Charity Hospital of Louisiana at New Orleans, it has been possible to assemble a series of 36 cases manifesting postpartum eclampsia. These cases occurred within the five year interval, from 1947, through 1951. During this time there were 51,903 deliveries giving an overall incidence of slightly more than 6 cases of postpartum eclampsia per 10,000 deliveries. The primary object of this study is to analyze these data to ascertain whether or not anticipation, and hence prevention of such a complication may be possible.

Postpartum eclampsia was preceded by some type of prenatal toxemia in 29 or 80 per cent of these cases. There were 25 cases preceded by pre-eclampsia alone, and 4 cases preceded by hypertensive disease with superimposed pre-eclampsia.

It is of considerable interest that 12 of the 36, or 33 per cent, were delivered by operative procedures. These procedures consisted of 10 forceps deliveries and 2 cesarean sections.

The time relationship between the delivery and the first convulsion is tabulated in Table 1 and represented graphically in Figure 1. One quarter of these patients convulsed within two hours after delivery and more than one-half convulsed within eight hours. Thirty-one, or 86 per cent, of the patients had their first convulsion within the first twenty-four hours following de-

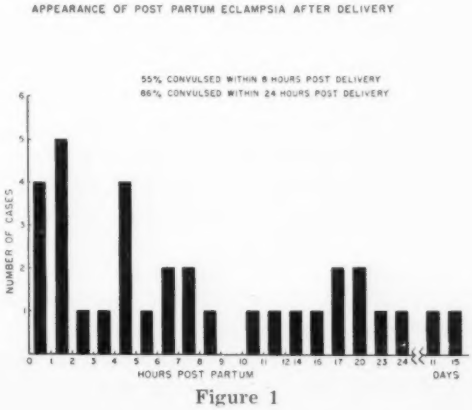
APPEARANCE OF POST PARTUM ECLAMPSIA AFTER DELIVERY
55% CONVULSED WITHIN 8 HOURS POST DELIVERY
86% CONVULSED WITHIN 24 HOURS POST DELIVERY
NUMBER OF CASES
HOURS POST PARTUM
DAYS

Figure 1

*Presented at the Seventy-second Annual Meeting of the Louisiana State Medical Society, Shreveport, April 30, 1952.

†Aided in part by the Edward G. Schlieder Educational Foundation of New Orleans, Louisiana.

From the Department of Obstetrics and Gynecology of Louisiana State University School of Medicine and Charity Hospital of Louisiana at New Orleans.

TABLE 1
TIME RELATIONSHIP BETWEEN THE FIRST POSTPARTUM CONVULSION AND DELIVERY

Time After Delivery		Number of Cases
Hours	Days	
1		4
1-2		5
2-3		1
3-4		1
4-5		4
5-6		1
6-7		2
7-8		2
8-9		1
9-10		1
10-11		1
13-14		1
15-16		1
16-17		2
19-20		2
22-23		1
23-24		1
24-48		1
	3-4	1
	6	1
	11	1
	15	1
	TOTAL	36

livery. The remaining patients had convulsions which appeared at varying intervals ranging from twenty-five hours to fifteen days after delivery. The latter case which has been described in detail elsewhere by this author[1] will be presented later in this paper.

The most important and most interesting data which came to light during this study portray the relationship between postpartum eclampsia and the amount of sedation employed prior to the onset of convulsions. Of the 36 patients, 28, or 78 per cent had received no sedation prior to the appearance of convulsions. Graphic representation of this appears in Figure 2. It also becomes apparent from Figure 2, that there has been no significant change in the yearly incidence of postpartum eclampsia occurring in Charity Hospital during this study interval.

More than one-half of the patients presented here were primiparae, 20 years of age or less.

Some type of prenatal care had been rendered to 69 per cent of the patients, although in 55 per cent, each of the patients received no more than two months of prenatal care.

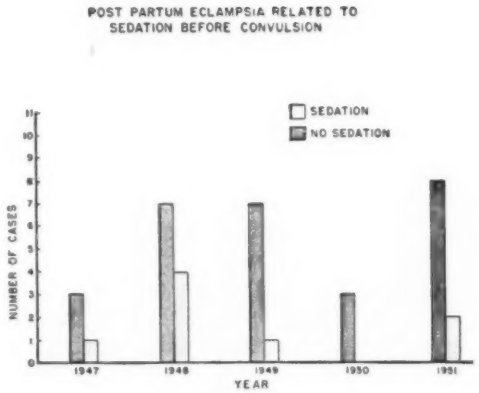

Figure 2

There was one maternal death in this series. This patient was a para 6-0-6 who was a known hypertensive with superimposed pre-eclampsia. She delivered uneventfully and was discharged on the second postpartum day. Six days after delivery, while at home, she had three severe convulsions and was admitted to the hospital in a state of profound coma. She presented characteristic signs of intracranial hemorrhage and expired within twenty-four hours of admission. The request for a complete postmortem examination was refused.

The most remarkable case study in this series is of the patient who had her first convulsion on the fifteenth postpartum day. This patient had made frequent visits to the prenatal clinic. At no time during her prenatal course or during her admission for labor and delivery was there any hypertension. She did, however, manifest some proteinuria during the three weeks prior to delivery. She had an uncomplicated labor and delivery and was discharged on the second postpartum day. Thirteen days later she began to complain of headaches, and at that time, noted some swelling of her face. These symptoms became more severe and on the fifteenth postpartum day, while at home, she had a generalized convulsion. She was promptly readmitted to the hospital in a semicomatose state. Her blood pressure was 180/120. Several hours later she had

a second generalized convulsion. The routine laboratory data and clinical findings, as well as special diagnostic procedures, including lumbar puncture, electroencephalography, and therapeutic trial with tetraethylammonium chloride were in every way consistent with the diagnosis of eclamptogenic toxemia. This patient has been seen at frequent intervals in the postpartum clinic for a period of more than nine months and repeated clinical and laboratory data indicate complete recovery.

DISCUSSION

In the analysis of the data presented, those factors which may enable us to anticipate postpartum eclampsia become very important, since prediction must necessarily precede prevention.

Of these 36 patients, 80 per cent manifested some type of toxemia prior to delivery. This figure is significantly higher than that reported by Stander *et al*[2]. In his series of 24 patients, only 11, or 46 per cent, had signs of toxemia during the prenatal period. By combining these two series we may conclude that the diagnosis of some form of toxemia during the prenatal course was made in 66 per cent of the patients.

It has been frequently and conclusively demonstrated that careful prenatal care with particular emphasis on diet and salt intake can almost completely prevent pre-eclampsia. Similarly, once pre-eclampsia develops it can be effectively treated in the vast majority of the cases, provided the disease is recognized during the incipient stage, and provided active therapeutic means are instituted without delay. It then becomes apparent that in this series where 55 per cent of the patients received no more than two months of prenatal care, prevention was effectively neglected. This neglect must be directly attributed to the patient, since prenatal care was sought so late in pregnancy.

The excitation incident to labor and delivery can and frequently does set off the trigger mechanism which initiates the transition from pre-eclampsia to eclampsia. It is well known that sedation provided by the opiates and barbiturates can very effectively prevent or control the convulsive episodes of eclampsia. The significance of this became apparent when it was found that in this series, 80 per cent of the patients had received no sedation prior to the onset of convulsions. The great importance of the adequate sedation of a toxemic patient following delivery cannot be overemphasized. During the past five years in Charity Hospital there has been no postpartum eclampsia occurring during the first twenty-four hours following delivery in a patient who manifested some type of toxemia prior to delivery and who had received sedation promptly following delivery and for the first twenty-four hours of the puerperium. Since 86 per cent of the patients convulsed within the first twenty-four hours of the puerperium, it is safe to assume that very effective prevention would result if the sedation of toxemic patients following delivery was continued for this length of time.

There remains a certain group of patients who present no signs or symptoms of toxemia throughout pregnancy and labor, but who convulse sometime during the early puerperium. It is very doubtful that any of these patients progress to this extreme without first manifesting some signs or symptoms of toxemia. The appearance for the first time of hypertension during the puerperium has been reported by Meyer[3] and Kaltreider.[4] The patient in this present series who convulsed on the fifteenth postpartum day may belong to this general category.

It then becomes mandatory that more careful and prolonged observation during the early puerperium must be available to the patient if this type of postpartum eclampsia is to be prevented.

CONCLUSION

1. In this series, 80 per cent of the cases manifested signs of toxemia prior to delivery.

2. Convulsions occurred within eight hours after delivery in 55 per cent, and within twenty-four hours after delivery in 86 per cent of the cases.

3. The earliest postpartum convulsion

occurred twenty-five minutes after delivery and the latest occurred on the fifteenth postpartum day.

4. Postpartum eclampsia can be prevented in the majority of cases by means of sedation of toxemic patients by opiates and barbiturates for a minimum of twenty-four hours after delivery.

5. Postpartum eclampsia occurring in patients who did not manifest signs of toxemia during pregnancy and labor can in all probability be prevented by more careful and more prolonged puerperal care.

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THE ROAD AHEAD FOR MEDICINE

The road ahead for organized medicine and for professional independence of the physician will not be easy. In the last twelve years, the affairs of medicine have progressed from one uneasy crisis to another. In the last four years, as the result of a magnitude of effort never before exerted in its behalf, organized medicine has temporarily overcome the enactment of laws to establish state medicine. On top of this, as a result of the recent election, we are assured of a government coming into power under the leadership of General Eisenhower that is opposed to state medicine, guised or disguised, in any form whatsoever.

Reflecting on this turn of events, we, as doctors, may have a tendency to feel that our battle is won, and that this projection of socialism into our midst need concern us no more. Such is not true. It is well to pause and reflect on the difficulties with which we may be faced, on the insecurities of our position in certain respects, and on the manner in which we may be vulnerable to guerilla tactics on the highway. We must remember that our enemies are defeated only in a formal battle. Their forces have not been annihilated nor their fanaticism diluted. The powerful bureaucratic group which is largely responsible for the organized effort of the Democratic party to foster state medicine will remain in Washington as civil servants. The socialistic group, who have captured the thinking of the Democratic party, will continue to guide its political thinking and action. The C. I. O. Political Action Committee in a recent pamphlet attempts to put the American Medical Association in a slanderous light. It says: "The A. M. A. and the conservation coalition will not even tolerate support of state and local Public Health Services." And further, General Eisenhower ran ahead of his party. This means that his tremendous majority was the result only partly of the trend away from socialistic thinking. The recent victory gives organized medicine an opportunity to take stock, and having done so, it should pursue a steady program.

It is our duty to secure our position against the uncertainties of the past. Continued vigilance is needed to prevent the enactment of legislation, piece by piece, which would eventually mean the establishment of state medicine. In addressing ourselves to secure these ends it is well to consider the organization and the individual standpoint.

The central point of the problem of organized medicine is the improvement of public relations and the impact of medical society action on the public. Relations with the press should be put on a basis satisfactory to both, and for this to be accomplished

certain concepts of the past will have to be altered. The position which doctors hold in social controversies must be explained to representatives of the press. The reluctance of the society or of the physician to appear in print leaves the field to our enemies, or at least to self appointed guardians.

The public has come to look upon our group as condoning fees that certain patients consider unreasonable. The basis for fees should be discussed, and rational comparisons made with fees in other fields. Medical mediation committees are now functioning in all states. This is the result of a four year campaign for the creation of such patient-physician relations bodies. These committees investigate complaints concerning the professional conduct and the ethical deportment of individual physicians, and attempt amicable adjustments. The existence of such committees, on the one hand, acts as a potential restraint on the occasional physician; and on the other hand, it gives the public an added sense of security when it is realized that the collective effort of the profession is directed towards their consideration.

Further assistance to medical education is vital to our efforts for freedom and to the scientific needs of medicine. The National Fund for Medical Education is launching a $5,000,000 industry-wide solicitation campaign in support of medical education in the United States. If this campaign succeeds, industry and finance will be carrying the torch for the cause of freedom in the medical schools. We owe them all possible support.

Community Health Councils have been organized in more than a thousand localities. They serve as a meeting ground where the capacities of the profession can be adapted to the health needs of the community. When such an understanding is established, the plea of the malcontents for medicine by statute loses its force. These Councils depend for their initiation and maintenance upon the support of the profession. In such ways, the ammunition of our critics is vitiated.

The payment of hospital and sickness insurance has grown in the past twenty years to where approximately 80,000,000 of our population have some form of such insurance. In effect, this spreads the cost of insurance through the whole population. In order for this insurance to expand and to continue to be effective, sympathetic assistance for its honest operation must be given by the profession.

The relation that the individual physician has to the road that medicine will follow in the years ahead is equally as important as that of his organization. Each one of us is a public relations agent for our organization and for medicine's future welfare. As such, physicians should make themselves available as speakers when information is needed on matters that concern medicine. The physician should make himself known as a party member and as a part of his precinct organization. He should be available to serve on boards of medical welfare. He should be conscious of his position as a citizen in the community as well as a servant in a noble profession.

Centuries ago Plato said: "The penalty that good men pay for refusing to take part in government is to live under the government of bad men." Recently, the president of the A. M. A., Louis H. Bauer, said: "Democracy works only when all the people take part in it. When only 51 per cent of the electorate exercise their right of franchise, as was the case in 1948, we are governed by 26 per cent of the population. This means we are no longer a democracy but an oligarchy." As an organization, we can work for our needs and fight for our principles. As individuals, we can follow the dictates of good citizenship, and spread the doctrine that state medicine is only the beginning of a socialist program; that every welfare state becomes a police state and that private enterprise and individual freedom are destroyed by either. The challenge to organized medicine and to the freedom of the individual physician is as important now as it was noisy in 1948.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

LOOKING FORWARD

Now, that the National Election is over, the physicians of our state should feel relieved and grateful to know that we will have in the White House, for the next four years, a President who will see eye to eye with those of us who believe in the free enterprise way of the practice of medicine.

We should, however, not reduce our interest or efforts toward keeping organized medicine on a high plane of efficiency and free from all parts or counterparts of socialized medicine. There has been some damage done already by our enemies, Mr. Truman and Mr. Ewing and their henchmen, who have tried to exploit our profession and force socialized medicine down our throats for the past number of years. Let us ever be on the alert and watchful for any opportunity to correct the evils of the past administration and to look forward to a brighter future, when we can continue to give the best of medical service to the public without interference from Washington.

We should do everything within our power to prevent the loss of our freedom through and by the signing of detrimental treaty agreements with other nations, fostered by some members of the United Nations organization, which treaties will transcend our Constitution and will deprive us of the privileges and advantages formerly enjoyed by the constitutional rights granted by this most cherished and revered document.

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"THE 40,000,000 GIRLS AND BOYS"

An exciting series of four dramatic radio broadcasts on the health of America's children—with a direct personal challenge to every parent, every teacher, every man or woman who wants the kids in his community to have the best possible protection, the best possible chance for long and active lives is presented jointly by the National Broadcasting Company and Health Information Foundation.

Make a date right now to hear these absorbing programs, each one starring an outstanding personality of stage or screen. Tune in on your NBC station every Saturday night beginning December 6th from 6:30 to 7:00, Central Standard Time.

December 6

What can you and your doctor do to conquer all the dangers which still threaten your baby in the crucial 30 days—his first month of life? An insight into the newest medical methods, the most advanced equipment—in a program which includes recordings direct from hospital nurseries.

December 13

How can you find out what lies behind a child's fears? What methods do experts use to bring those fears into the open? The dramatic story of doctors and parents working to fight off the shadows which can cloud a child's mind and damage his physical health.

December 20

What are our schools doing to safeguard the health of young children? And why is it up to you to make these programs work? Hear what happened in town after town when parents made up their minds to have their children treated for the physical defects detected in school health examinations.

December 27

Are you making full use of all the different kinds of help your family doctor can offer as your child grows up? Do you know when and how to use him? How best to cooperate with him in long-range plans as well as in time of illness?

———o———

STUDENT AMA

The Student American Medical Association is offering honorary membership to physicians, and is encouraging them to

join their organization. The dues for this type of membership are $5.00 per year and entitle the physician to a subscription to the 72-page monthly journal of this Association, participation in the annual convention and other activities of the Association. Those physicians and friends who are interested in the welfare of our medical students and wish to become honorary members may do so by writing Mr. David Buchanan, Student AMA, 535 North Dearborn Street, Chicago 10, Illinois.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Third Thursday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

In order to assist specialty groups in selection of dates for meetings and for information of the doctors of the state, information concerning scheduled meetings will be carried in this section of the Journal. Officers of specialty groups are therefore requested to furnish information in this regard.

THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The sixteenth annual meeting of The New Orleans Graduate Medical Assembly will be held March 2-5, headquarters at the Municipal Auditorium.

Eighteen outstanding guest speakers will participate and their presentations will be of interest to both specialists and general practitioners. In addition, the program will include a symposium on "The Value of Newer Drugs," daily demonstrations of medical and surgical procedure in color television, clinicopathologic conferences, medical motion pictures, over 100 technical exhibits and three roundtable luncheons.

Guest speakers participating are as follows:

DERMATOLOGY—J. Lamar Callaway, M. D., Durham, North Carolina.

GASTROENTEROLOGY—A. H. Aaron, M. D., Buffalo, New York.

GYNECOLOGY—Herbert E. Schmitz, M. D., Chicago, Illinois.

HEMATOLOGY—Carl V. Moore, M. D., St. Louis, Missouri.

INTERNAL MEDICINE—Rudolph H. Kampmeier, M. D., Nashville, Tennessee.

INTERNAL MEDICINE—Henry A. Schroeder, M. D., St. Louis, Missouri.

NEUROSURGERY—Guy L. Odom, M. D., Durham, North Carolina.

OBSTETRICS—Andrew A. Marchetti, M. D., Washington, D. C.

OPHTHALMOLOGY—Harold F. Falls, M. D., Ann Arbor, Michigan.

ORTHOPEDIC SURGERY—J. Vernon Luck, M. D., Los Angeles, California.

OTOLARYNGOLOGY—G. Edward Tremble, M. D., Montreal, Canada.

PATHOLOGY—Arthur P. Stout, M. D., New York, New York.

PEDIATRICS—Waldo E. Nelson, M. D., Philadelphia, Pennsylvania.

RADIOLOGY—Edward B. D. Neuhauser, M. D., Boston, Massachusetts.

SURGERY—George Crile, Jr., M. D., Cleveland, Ohio.

SURGERY—Robert E. Gross, M. D., Boston, Massachusetts.

SURGERY—Charles W. Mayo, M. D., Rochester, Minnesota.

UROLOGY—Wyland F. Leadbetter, M. D., Boston, Massachusetts.

The Assembly has planned another interesting postclinical tour to follow the 1953 meeting in New Orleans. On Saturday, March 7, a party composed of doctors and their families will leave New York for Europe on the great new superliner, S. S. United States. The itinerary includes England, France, Switzerland and Italy, and arrangements have been made for medical programs in these countries. The tour ends in Rome and the group will return to New York on March 31 by Pan American World Airways, President Special.

Details of the New Orleans meeting and the postclinical tour are available at the office of the Assembly, Room 103, 1430 Tulane Avenue, New Orleans 12, Louisiana.

CLINICAL CONFERENCE OF THE CHICAGO MEDICAL SOCIETY MARCH 3-6, 1953

March 3, 1953, will be the opening day of the 9th annual Clinical Conference of the Chicago Medical Society. This Conference is designed to be of interest to both the specialist and the general practitioner. It will be held at the Palmer House in Chicago and will present a variety of subjects setting forth the latest information available to the medical profession.

Conducting the Conference will be a faculty ranging from 35 to 40 outstanding speakers each offering a presentation relating to their specialty. In addition another group will give daily teaching demonstrations which will include the presentation of patients. They will emphasize the actual technique to be employed in handling orthopedic, medical and pediatric problems. In addition to holding these demonstrations each day, there will be a panel discussion at a round table luncheon presenting topics of timely interest.

This is an activity of the Chicago Medical Society for its membership to whom no fee is charged. Those who are not members of the Chicago Medical Society are asked to register for the four days at the nominal fee of $5.00.

AS YOU LIKE IT

Perhaps you've known someone who had tuberculosis . . . possibly a member of your own family was spared a long and anxious hospital stay because me learned in time that he had TB . . . or maybe you just believe that an ounce of prevention is worth a pound of cure.

When you buy Christmas Seals, you buy them for your own reason. Nobody tells you that you *have* to support this fight against tuberculosis. The Tuberculosis Association is a "voluntary" organization, which means that it is supported by people giving of their own free will.

When you get your seals every Christmas, you buy them, or return them, or throw them into the wastepaper basket. It is in the privacy and convenience of your own home that you are asked to consider support of this anti-tuberculosis program.

Prevention is the Association's chief aim and it works in that direction by case-finding assistance, research grants, education of the public and promotion of legislation, including that which would provide better facilities for treatment of the tuberculous. That is a monumental task, but it can be accomplished with your help.

RESULTS OF 23-YEAR STUDY OF ANGINA PECTORIS VICTIMS

A 23-year study of 6,882 persons suffering from angina pectoris associated with coronary sclerosis was presented in the September 27 Journal of the American Medical Association.

The study, the largest and longest ever undertaken, disclosed that 58.4 per cent of those persons suffering from this form of heart trouble survived five years, as compared with the survival rate of 86.9 per cent for the normal population. The 10-year survival rate for the series was 37.1 per cent, against the normal rate of 70.4 per cent. Survival studies showed that mortality was greatest in the first year, about 15 per cent, and that it was approximately 9 per cent per year thereafter.

The minimal follow-up period of the patients reported on in the study was five years, and the maximal period, 23 years. The average age at diagnosis of the disease was 58.8 years, 58.5 years for the males and 60.1 for the females. Average duration of symptoms prior to diagnosis was 2.5 years.

EXTENDED REST MAY BE DESIRABLE IN MEASLES

An extended period of rest may be desirable following measles, especially for children under eight years of age. This is indicated in a study by Ross* of electrocardiographic records of 71 children hospitalized with the disease.

Although clinical observation of these patients revealed little evidence of cardiac abnormalities, the ECG's showed "probably abnormal" findings in a significant proportion of the group.

The children ranged in age from four to 14 years, with a higher incidence of electrocardiographic disturbances in the group under eight years of age. There was no history of previous cardiac disease, rheumatic fever, or diphtheria so far as could be ascertained. While it was not possible to perform serial ECG's to determine the time required for the tracings to return to normal, follow-up examinations in a few children showed that all the abnormalities had not yet disappeared when the children resumed their full activity after having had the measles.

NEW ANTIBACTERIAL DRUG, FURADANTIN, REPORTED CLEARING UP RESISTANT URINARY INFECTIONS

Use of a new broad-spectrum chemotherapeutic agent, Furadantin, has cleared up certain kidney and bladder infections that were unresponsive to intensive treatment with antibiotics, Dr. Charles E. Friedgood of Brooklyn reported recently to the American College of Surgeons, meeting at the Hotel Waldorf-Astoria.

The drug is the first of the nitrofuran family to be developed for systemic use in human beings. The report covered 22 patients who were treated for cystitis (inflammation of the bladder) and

*Ross, L. J.: Am. J. Dis. Child. 83:282 (Mar.) 1952.

pyelonephritis (a kidney inflammation). Clinical and laboratory cures were reported in 14 instances and cure of symptoms in the other 8. There were no failures. In each instance, the infecting bacterium was the Proteus organism.

"The results of this study," said the physician, "indicate Furadantin to be a safe and effective drug, giving relief of all urinary symptoms without any toxic effects. No cases of sensitization to Furadantin occurred."

BOOK REVIEWS

Hormones and Body Water; by Robert Gaunt, Ph.D., James H. Birnie, Ph.D. Springfield, Charles C. Thomas, 1951. pp. 57. Price, $2.25.

This is a brief, but excellent, review of the role of the various hormones in the regulation of water in the body. Each gland is considered separately and its known effects interrelated with those of the other endocrine glands. Current theories are presented and their limitations discussed. Each chapter contains excellent diagrams and summaries of the material under consideration. The 132 references have been carefully chosen and should be valuable to the interested reader. Chapters on the role of endocrines in water distribution in toxemias of pregnancy and water intoxication are also included, as are discussions on the effects of the liver and the adaptation syndrome, and water metabolism of the newborn. In connection with the latter problem, the authors point out that the pattern suggests endocrine insufficiency insofar as the water metabolism is concerned. An especially interesting chapter is the succinct discussion of "evolutionary considerations" in which the authors conclude that "the comparative physiologist has an inviting task before him—that of writing the role of endocrine agents in this panoramic series of evolutionary events. At this moment it is, except as regards the posterior pituitary, essentially an untold story."

H. S. MAYERSON, PH.D.

Clinical Heart Disease; by Samuel A. Levine. Philadelphia, W. B. Saunders, 1951. edition 4, pp. 555, illus. Price $7.75.

This volume is organized and the material is presented very much the same as in the previous editions. It is not encyclopedic in the field of cardiology, nor was it intended to be. The various subjects are presented in unrelated chapters. Though not encyclopedic the subject of each chapter is adequately discussed.

This volume is easy to read and the author's ideas are interestingly presented. The principal emphasis throughout the book is on bedside diagnosis by careful physical examination rather than by laboratory methods. Principles which are easy to apply to clinical diagnosis and management as well as the recognition of reversible types of heart disease are stressed.

The chapter on congenital heart disease is somewhat disappointing in that diagnosis by physical examination is not as adequately emphasized as in the remainder of the book.

The chapter on electrocardiography has been expanded considerably. The remainder of the book is intended for the beginner, but this chapter is not so designed. The plates are numerous and fairly well reproduced, although some of the tracings are technically inadequate. The discussion in this chapter is more of clinical cardiology than electrocardiography.

This fourth edition represents a continued contribution in the field of clinical heart disease by the author.

C. T. RAY, M D.

PUBLICATIONS RECEIVED

J. B. Lippincott Co., Phila.: Bacterial and Mycotic Infections of Man, edited by René J. Dubos, Ph.D. (2nd Edit.).

The C. V. Mosby Company, St. Louis: Synopsis of Obstetrics, by Jennings C. Litzenberg, B. Sc., M. D. (4th Edit.), revised by Chas. E. McLennan, M. D.

W. B. Saunders Co., Phila.: Standard Values in Blood, edited by Errett C. Albritton, A. B., M. D.; Ophthalmic Pathology, an Atlas and Textbook; Electrocardiography in Practice by Ashton Graybiel, M. D., Paul D. White, M. D., Louise Wheeler, A. M., and Conger Williams, M. D. (3rd Edit.); Diseases of Metabolism, edited by Garfield G. Duncan, M. D. (3rd Edit.); Nutrition and Diet in Health and Disease, by James S. McLester, M. D., and William J. Darby, M. D., Ph.D. (6th Edit.); Practical Dermatology for Medical Students and General Practitioners, by George M. Lewis, M. D.

Charles C. Thomas, Publisher, Springfield, Ill.: Acute Peripheral Arterial Occlusion, by William D. Holden, M. D.; Essentials of Infant Feeding for Physicians, by Herman Frederic Meyer, M. D.; Radiologic Diagnosis of the Lower Urinary Tract, by Donald E. Beard , M. D., William E. Goodyear, M. D., and H. Stephens Weens, M. D.; Post-Graduate Lectures on Orthopedic Diagnosis and Indications, by Arthur Steindler, M. D.

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